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WALTER A. KENYON

The Miller Site

ROYAL ONTARIO MUSEUM – UNIVERSITY OF TORONTO

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WALTER A. KENYON *The Miller Site*

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Introduction

Any extensive field project in archaeology necessarily involves a large number of different people, organizations and disciplines. The excavation of the Miller Site was no exception. At every stage in the operation, there were problems which could be solved only by reference to a specialist. Many of these were technical problems in excavation techniques and interpretations. These were discussed with the late Professor T. F. McIlwraith, Department of Anthropology, University of Toronto, with Professors J. N. Emerson and R. C. Dailey, Department of Anthropology, University of Toronto, and with Professor Kenneth E. Kidd, Department of Anthropology, Trent University, Dr. William A. Ritchie, State Archaeologist, University of the State of New York, and Dr. J. V. Wright, National Museum of Canada, Ottawa.

Problems in geology and mineralogy were referred to Dr. V. B. Meen, Chief Mineralogist, and Dr. Walter M. Tovell, Curator of Geology, Royal Ontario Museum, University of Toronto. Dr. C. S. Churcher, Research Associate, Department of Vertebrate Palaeontology, Royal Ontario Museum, University of Toronto, analyzed all of the mammal-bones from the site. Dr. W. B. Scott, Curator of Ichthyology and Herpetology, and Dr. E. S. Crossman, Associate Curator of Ichthyology and Herpetology, analyzed the fish and reptile remains, while Mr. D. H. Baldwin, Artist-Craftsman, Department of Ornithology, identified the bird-bones.

Human bones were analyzed by Professor J. E. Anderson, Department of Anthropology, University of Toronto, and Professor Nancy S. Ossenberg, Department of Anatomy, University of Alberta, Calgary, Alberta. The osteological analysis of the Miller Site population forms a separate report which is deposited with the Royal Ontario Museum.

Equally important to the Miller Site excavation were the contributions of the following: Miller Paving Ltd., the owner of the property on which the site is located, not only granted permission for extensive excavation over a long period of time, but also loaned us a large portable field-kitchen and dining room; Imperial Oil Ltd. solved one of the perennial problems of fieldwork with a very substantial research grant; Volkswagen Canada Ltd. supplied us with the use of a truck for an entire season; the Council of Pickering Township, particularly the Reeve, Mr. Sherman Scott, was extremely tolerant regarding traffic congestion caused by the influx of visitors who wished to watch the excavations. In addition, the Council provided us with several hundred feet of snow-fence which was used to control the movement of visitors through the site.

To all of the individuals and organizations listed above, I am extremely grateful. Without their cooperation, this research would have been virtually impossible.

W. A. K.

I *The Miller Site*

PROLOGUE

Early in the spring of 1958, the Miller Paving Company sent an operator with a power shovel to dig a number of randomly scattered holes on their property near the village of Pickering, 25 miles east of Toronto (fig. 1). The purpose of the exploratory holes was to determine the extent and depth of sands and gravels which the company uses in its paving operations. Some time later in the spring, Mr. W. Webb, Dunbarton, Ontario, was exercising a hound on the Miller property when he noticed a round, white object protruding from the wall of one of the holes, several feet from the surface. On climbing into the hole for a closer examination of the object, he discovered that it was a bone. He discovered, further, that many bones were scattered along the floor of the pit, and that one of these appeared to be a human skull. He immediately notified the Ontario Provincial Police.

The police removed some bone fragments for examination by the staff at the Attorney-General's Crime Laboratory, and Mr. Barry Murkur, Pickering, telephoned the Royal Ontario Museum asking that they investigate the pit. It was felt by both the Ontario Provincial Police and the local residents that the discovery might be of some archaeological significance. I visited the site immediately but, as the ground was still frozen, could do nothing more than mark its location and observe, tentatively, that it was probably a small Iroquois ossuary.*

On March 2nd, 1958, I returned to the site with a small crew to undertake what I thought would be a brief, simple task — the removal of a few skeletons from the undisturbed, northern half of the burial pit. Arriving at the site, we measured the location of what appeared to be the centre of the pit in relation to the point where the centre of the road allowance for Concession III, Pickering Township, intersects the allowance for Valley Farm Road. From this point, the centre of the pit was located 84.0′ North and 110.0′ East.

When the exposed face was cleaned up, a clear profile view of the pit was evident. Three and one-half feet deep and six feet wide at the top, it tapered to four and one-half feet at the bottom. Because an unknown portion of the grave had been destroyed prior to our investigation, it is impossible to locate our sectional view with regard to the original pit outline. It is probable, however, that our measurements were taken near the centre of a pit that was roughly circular.

*The word "ossuary", as used in this report, refers to a mass grave containing the disarticulated and randomly scattered bones of a number of people. This definition is technically unsatisfactory for two reasons: First, an ossuary may contain, in addition to the disarticulated and randomly scattered bones which constitute the bulk of the material, both primary burials and bundle burials (e.g., Kidd, 1953:361; Churcher and Kenyon, 1960:253). Second, the word "ossuary" is, to many people, associated with the Feast of the Dead, so vividly described by Jean de Brébeuf, a Jesuit priest who was present at the ceremony in Huronia in 1636 (Thwaites, Vol. X, pp. 279-305: Anderson, 1964, p. 28). I prefer to avoid this association, however, because the mode of burial is probably not co-terminous with the ceremony that Brébeuf described.

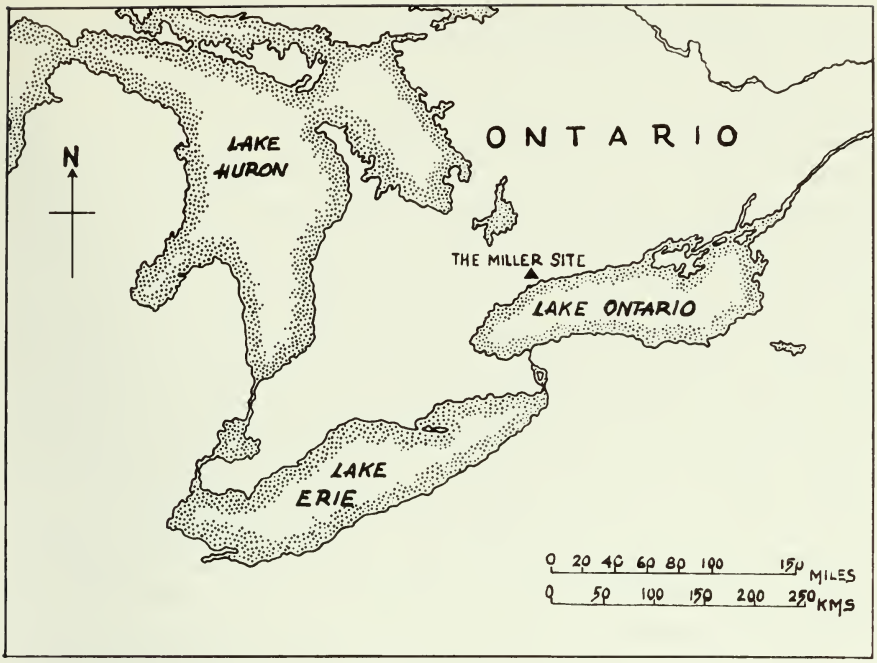

Figure 1 *The Miller Site in relation to the Great Lakes*

The bones, in a 12-inch stratum at the bottom of the pit, mainly represented parts of thirteen different individuals. Although they consisted of disarticulated bones, there was some variation. At the eastern edge of the pit was found the skeleton of a new-born infant in the foetal position. It had been placed on its left side, heading south. Beneath the infant was a cremation that must have been buried in a container of some variety. Although no evidence of the container was found, the fragments of calcined bone formed a neat pocket, with clearly circumscribed borders. Near the eastern edge of the pit, also, were found the articulated bones of one hand and one foot; in the northwest quadrant was an articulated left fore-arm. On the bottom of the pit were two torsos; both were placed on their backs and heading north. The one on the east had, in addition to the pelvic girdle, seven articulated vertebrae; the one on the west consisted of the pelvic girdle with six articulated vertebrae. Between the pelvic girdles, two skulls were found. And while we were working, visitors informed me that "some people took three skulls from the same place." If this report is correct, there was originally a nest of five skulls slightly to the east of the centre of the pit floor. Associated with the skulls were the following grave-goods: 1 bone harpoon (Plate 12, fig. 3), 2 sawn fragments from the long-bones of some large mammal, 4 pectoral spines of the channel catfish (*Ictalurus punctatus*), all of which had been modified, and bones from two loons (*Gavia immer*). Also found in the same area was one clam shell. This was unmodified and may simply have been

part of the grave fill. Around the edges of the pit floor was a line of long bones, mostly femora, placed end to end, which appeared to be placed there intentionally.

Although most of the grave fill was sand, there were two lenses of refuse containing flecks of ash and charcoal, fragments of fire-cracked stones, fish vertebrae and a few rimsherds. The latter had rolled rims decorated in various designs executed with a linear dentate stamp, and internal punctations which had raised exterior bosses. This was certainly not Iroquois pottery, nor was it familiar to any member of the crew.

A brief reconnaissance of the area around the pit revealed no evidence of human occupation. About 150 yards to the northeast, however, was a fine spring in the bottom of a shallow ravine. Testing along the edge of the ravine disclosed the occasional potsherd or flint chip, but evidence of human occupation in the area was extremely scarce. Finally, some 300 feet south of the spring we found a small area, possibly 15 feet across, that appeared to be a midden. The soil was thick and black, in contrast with the light sandy soil we encountered elsewhere in the vicinity, and the artifact content was extremely high. Because of previous commitments we were unable to investigate the deposit at that time. We simply marked its location, and decided that it was an isolated camp-site.

When an opportunity presented itself the following September, we returned to the site for a long week-end, intending to excavate the midden. Choosing an arbitrary spot to the south of the deposit, we drove a long iron stake into the ground as a reference point; from there, we laid out a north-south grid system of five-foot squares. These we excavated by trowel in three-inch levels. Although the artifact content was extremely high in the four central squares, it tapered off sharply as we moved outward in any direction. We discovered, also, that our vertical control of the data was unnecessary, as the field had been ploughed. That is, our entire sample of material from the midden had been removed from the upper six to nine inches of humus, and at the bottom of this horizon were clearly defined plough-lines. Below the plough-lines was clean, sterile, water-deposited sand.

At this point, near the end of our brief excavation, one of the crew called attention to a small, circular stain in the sand at the bottom of his square. Examination suggested that it might be a post-mould. As he trowelled the square down another half inch, a regular line of post-moulds appeared. They were 3.5 inches in diameter, and sectioning showed that the posts had been set into the ground 24 inches. Thinking that we had probably found the wall of a pre-Iroquoian house, and having already determined that the adjacent squares were probably sterile, we decided simply to follow the line of post-moulds to see where it would lead. One student, with shovel and trowel, was assigned to each end of the line. As the students uncovered additional post-moulds at the ends of the line, they marked them with meat-skewers. Slowly, the line increased in length, forming a long, sweeping curve with the concave side to the north. It soon became apparent that what we were following was probably a palisade rather than the wall of a house.

As it was getting late in the season, we were forced to stop the excavation. At that time — October 1958 — we already had a large body of data, but

were unable to interpret our findings in any satisfactory manner. We had decided, initially, that the burial which led to the discovery of the site was a small Iroquois ossuary. Later, after examining a few rimsherds from the two lenses of refuse that were interspersed with the grave-fill, we decided that it was not Iroquois, and must therefore be pre-Iroquois. Finally, after examining a reasonably large sample from what appeared to be a small, disturbed midden, there was again a suggestion of Iroquoian affinities. This latter suggestion derived largely from a few rimsherds that appeared, superficially, to be of the Iroquois Linear (MacNeish, 1952) and Ontario Horizontal types, and from a few that exhibited incising as a secondary motif; in addition to this, however, we had excavated a few kernels of charred corn — a suggestion of incipient agriculture — another characteristic which we would associate with an early Iroquoian settlement. Finally, we had the recently discovered palisade, fashioned from thin, slender poles. It was highly probable, then, that the Miller Site was a late — a very late — pre-Iroquoian village.

Up to this point, the operation had consisted entirely of salvage archaeology and exploratory trenching. This work had produced important specimens and information, but lacked any comprehensive plan that would give it form or direction. If current estimates regarding its age and cultural affiliation were correct, then, the site should have been occupied about A.D. 800 to 1000; personally, I preferred the earlier date, as this would allow a greater period of time for Iroquoian development. In any event, the site was pre-Iroquoian, but exhibited a sufficient number of Iroquoian characteristics to suggest that it was very close to the beginnings of the Iroquois sequence in Ontario. If this were true, the Miller Site presented a unique opportunity to investigate, in considerable detail, the remains of a community which must have been occupied just prior to the appearance of the Iroquois in Ontario's prehistory.

One of the primary advantages of the site, apart from strictly scientific considerations, was the fact that it was available for extensive and continued study. Eventually, it would be fed into the crushers and screens of the Miller Paving Company, but this was far in the future. Meanwhile, we had permission to dig as long and as deep as was necessary to get the answers we wanted. Its main advantage, probably, was the ease with which the post-moulds were located. They contrasted sharply with the clean sand that was immediately below the ploughed, humus level, that is, the upper six to nine inches. It seemed reasonable to assume, then, that we would have little difficulty in tracing the entire palisade, and thus determining the size of the settlement. And in the event that the residents of the village had constructed any kind of dwellings that involved setting upright poles into the ground, we should be able to locate them with equal ease. We had every reason to believe, therefore, that continued excavation at the site would reveal the size of the settlement, and the size, number and orientation of any dwellings or other structures that it might contain. We already had a fair sample of pottery, tools and weapons and at least some knowledge of the diet of the inhabitants, as we had unearthed a small sample of mammal and bird bones and a relatively large sample of fish bones, in addition to a few kernels of charred corn.

The origin of the Iroquois has been a perplexing problem for many years. Until fairly recently, most scholars saw them as intruders into the area which they occupied in the historic period. While there are three different localities from which the migration hypotheses derive the Iroquois, these are essentially variations on a single theme. They differ mainly in that some students trace the Iroquois farther back than others.*

They all, for example, see the Iroquois as moving (in whole or in part) from the St. Lawrence valley into the locality they occupied in the historic period. The origin of this theory may lie in the traditions of the Iroquois themselves; it may, on the other hand, derive from the fact that the Iroquois settlement which Cartier visited in what is now Montreal in 1535, was abandoned when Champlain arrived there in 1603.

Ritchie (1961:27) suggests that the basic stimulus for the various migration theories probably came from Nicholas Perrot, who stated about 1700 that: "The country of the Iroquois was formerly the district of Montreal and Three Rivers" (Blair, 1911, Vol. I, p. 42). Colden (1922:Vol. 1:3) as well as Morgan (1851:5) repeat what is in essence the same tradition. A recurring part of this hypothesis is the tradition that the Iroquois learned horticulture from the Adirondacks, their Algonkian-speaking neighbours, who subsequently drove them from the Montreal area.

Perhaps the best known migration theory in Iroquoian studies is that of Arthur C. Parker (1916:pp. 479-507). According to Parker, the Iroquois, prior to their residence in the St. Lawrence, lived originally near the mouth of the Ohio River some 650 to 700 years ago, or about A.D. 1250 to 1300. Parker apparently chose this location as their earlier home because of a similarity between some of the sherds from the area occupied by the Five Nations Iroquois in the historic period, and sherds from the mouth of the Ohio:

> Certain forms of Iroquoian pottery, as in western New York, do not greatly differ from those discovered in the mounds of Ohio, especially certain pottery forms described by Prof. Mills, of Ohio State University. The forms to which we refer are those having a globular body and short neck with a wide flaring mouth; the entire surface of the body being decorated with the marks of a paddle wrapped with grass stems or brushed while still plastic with the same material (1916:498).

In technical terms, we would say today that Parker had mistaken Point Peninsula or Owasco pottery for Iroquois pottery. At the time he was writing, this was a natural thing to do, for the time-depth involved in the prehistory of this region was not established till the advent of radiocarbon dating. Almost invariably, the earlier students compressed their cultural

*We are concerned, in this report, with what might be described as the short term, archaeological viewpoint only. That is, we are concerned, primarily, with the recent history of a congeries of material items.

From a different viewpoint (e.g., Fenton, 1940), our problem is but one phase of a larger and more comprehensive question regarding Iroquois origins.

periods and sequences into too short a time-span. Adena, for example, was estimated as dating from about A.D. 500 to 900 (Martin, Quimby and Collier, 1947:263). On the basis of radiocarbon analysis, the total range of Adena dates is from 830 B.C. to A.D. 782 (Griffin, 1958:5).

Here, probably, is the key to Parker's theory. In the general intellectual climate of the period, there was simply not enough time for the development of anything as sophisticated as Iroquoian culture. Therefore, the Iroquois must have migrated into the area which they occupied in the early historic period. (Cf. Lloyd, H.M., in 1901 edition of Morgan's *League*.)

W. A. Ritchie, a student of Parker, accepted the migration hypothesis in his earlier writings (e.g., 1944:5). Five years later, however, he says,

> In both the Point Peninsula and the Owasco series definite trends are observable and, indeed, certain of these trends appear to link the two discrete series, while in turn, some of the observable Owasco tendencies seem to continue on into Iroquois (Ritchie and MacNeish, 1949:119).

By 1961, Ritchie's position regarding the origin of the Iroquois is much more precise:

> Despite the enduring hold exerted by the sundry migration hypotheses upon students of the Iroquois, it seems a valid conclusion that as a mechanism to account for the northeastern position of the Iroquois people and their culture, migration fails in demonstrating any route north, south, or west, over which archaeology can convincingly trace a prior or developmental movement. Without question major movements of Iroquoian groups have taken place within the general area, as already noted for the exodus of Iroquoian groups from the St. Lawrence Valley, sometime in the 16th century, but this is quite another matter from deriving the Iroquois as a whole by mass movement from the same or another locality (1961:29-30).

That migration hypotheses have failed to explain the historic position of the Iroquois is due not only to the fact that supporting evidence is lacking. Equally important, probably, is the fact that current theories tend increasingly to be based on archaeological data, while the earlier theories were based largely on impressionism and oral traditions. Ritchie, of course, was fully aware of this (cf. 1961:27), as would be expected, because much of the archaeological data on which current theories are based was excavated and reported by Ritchie himself.

The *in situ* theory of Iroquois origin that was adumbrated by Ritchie and MacNeish in 1948 was fully developed by the latter scholar over the following three years (MacNeish, 1952).

To work out his sequence, MacNeish employed the direct historic approach. That is, he worked from documented historic sites backward through time "on the basis of seriated or overlapping pottery types and ceramic trends" (MacNeish, 1952:1). He found, generally, that each tribal group had its own distinctive pottery types, with the exception of the Onondaga and Oneida series which are virtually indistinguishable. Comparing these ceramic sequences with the pre-Iroquoian ceramic trends and relationships previously established for the same area (Ritchie and MacNeish, 1949), MacNeish arrived at the following conclusions:

(1) In Middle Woodland times, there was a single, relatively homogeneous

culture spread over New York State and peninsular Ontario, called Point Peninsula.

(2) From Point Peninsula, four regional variants with an Owascoid material culture gradually emerged. These, in turn, developed into four early Iroquoian ceramic traditions, one of which was found in Peninsula Ontario at the Uren Site (Wintemberg, 1928).

The stylistic trends upon which this theoretical structure was based are summarized by MacNeish (1952:82) as follows:

> General trends in all Iroquois series (from early to late) are for the Owascoid cord-wrapped paddle-edged type of design to disappear; the cord-wrapped, paddled, and check-stamped surface finish to be submerged by the smoothing technique, and decoration on the neck gradually to diminish and, in most series, to disappear. In other words, Owasco ceramic characteristics carry over into the Iroquois series, though they are gradually disappearing. Some of the trends that started in Owasco continue throughout the Iroquois series, for all through the Iroquois development collars become better defined and castellations are more profound and elaborate. Incising becomes the only decorative technique, decoration is confined to the collar, and the paste is generally improving.

In the diagrammatic presentation of his theory of Iroquoian development, MacNeish (1952:87) derives the Ontario Iroquois from an Ontario Owasco. He notes, however, that the relationship is tenuous, and that more data are required. Textual references to this Ontario Owasco are limited to the lowest levels of the Middleport Site (Wintemberg, 1948), and to the Krieger (Kidd, 1954) and Goessens (Lee, 1952) Sites. Although the nature and cultural characteristics of this "Ontario Owasco" have never been defined, the *in situ* theory of MacNeish has still been generally accepted as a working hypothesis.

The discovery of the Miller Site resulted from a routine salvage operation. Once discovered, however, it was apparent that it provided an opportunity to test the *in situ* theory of MacNeish, particularly in reference to the postulated "Ontario Owasco." The excavation of the Miller Site would not only provide a large sample of sherds. It should, in addition, furnish valuable data regarding other aspects of pre-Iroquoian material culture. That is, it could conceivably test the *in situ* hypothesis of MacNeish against a broader cultural spectrum. For if the Ontario Iroquois developed from an Owascoid culture which occupied Ontario in pre-Iroquoian times, then evidence of this cultural continuity should not be confined to a ceramic sequence.

The excavation of any late pre-Iroquoian village in peninsular Ontario would be significant in that it would furnish us with data which are not available at present. Its theoretical significance lies in the fact that two salient features of central and south-western Iroquois culture — ossuary burial and the long house — do not derive from the New York Owasco (Guthe, 1960: 212). In his discussion of the problem of Iroquois origin, Guthe continues:

> This review of selected culture traits found in Iroquois sites does not completely support an Owasco origin for Iroquois culture. It suggests that there were multiple sources for the Iroquois, one of which was the Owasco culture.

As was noted above, migration hypotheses to explain the historic position of the Iroquois have become progressively untenable. The *in situ* hy-

pothesis of MacNeish on the other hand, while generally accepted as a theoretical framework, has never been tested against that final arbiter of archaeological controversy — an excavation. This is true, particularly, of peninsular Ontario where the hypothetical "Ontario Owasco" has never been investigated.* The discovery of the Miller Site presented an opportunity to carry out such an investigation. It was decided, therefore, that all, or at least a very large portion, of the village should be excavated.

II *Excavation*

The Miller Site is located on the southwest corner of Lot No. 20, Concession 3, Pickering Township, Ontario County, Ontario. Its geographic co-ordinates are 43°52′N., 79°6′ W. Situated near a central branch of Duffin's Creek (fig. 2), it occupies a small "estuary" of glacial outwash, a thin stratum of sand which overlies a medium to coarse gravel. About one mile to the northwest is a raised beach, the ancient shoreline of glacial Lake Iroquois. The old beach is 255 feet above the current level of Lake Ontario. The site itself is 165 feet above the present lake, and 90 feet below the old beach. To the south, Lake Ontario is 3.25 miles away.

When we first visited the site, it was covered largely by a dense stand of locust, most of which were young trees under three inches in diameter. These had spread from an original cluster of larger, older trees which had been planted around the house and barn which at one time stood on the northern edge of the village (fig. 4). The southeast portion of the site was covered by a scattered stand of sumac. Apart from this, the surrounding area is devoted to pasturage, except for one large stand of pine about ¼ mile south of Concession 3, and on the east side of Valley Farm Road. The valleys of both the east and west branches of Duffin's Creek are covered mainly by dense stands of cedar, although both pine and poplar occur on the upper edges of the ravines.

As soon as it was decided to undertake extensive excavations at the site, a grid system was established, using the iron bar mentioned earlier as a reference point. From here, a series of north-south and east-west lines was laid out covering an area which was larger than the village, as estimated from the degree of curvature of that portion of the palisade which had already been exposed. At the intersection of these lines — that is, every 50 feet — a short post was set in the ground, and a nail was driven into the top of the post as a more precise reference point. A contour map of the village area was then drawn, using two-foot intervals (fig. 3). Next, the exposed portions of the palisade were plotted upon this map. In order to estimate as accurately as possible the amount of time and money that would be necessary to excavate

*The works of Lee and Ridley are significant initial contributions to the problem of Western Iroquois origin. But neither of these scholars had the wealth and range of comparative data required to draw the conclusions that can now be reached.

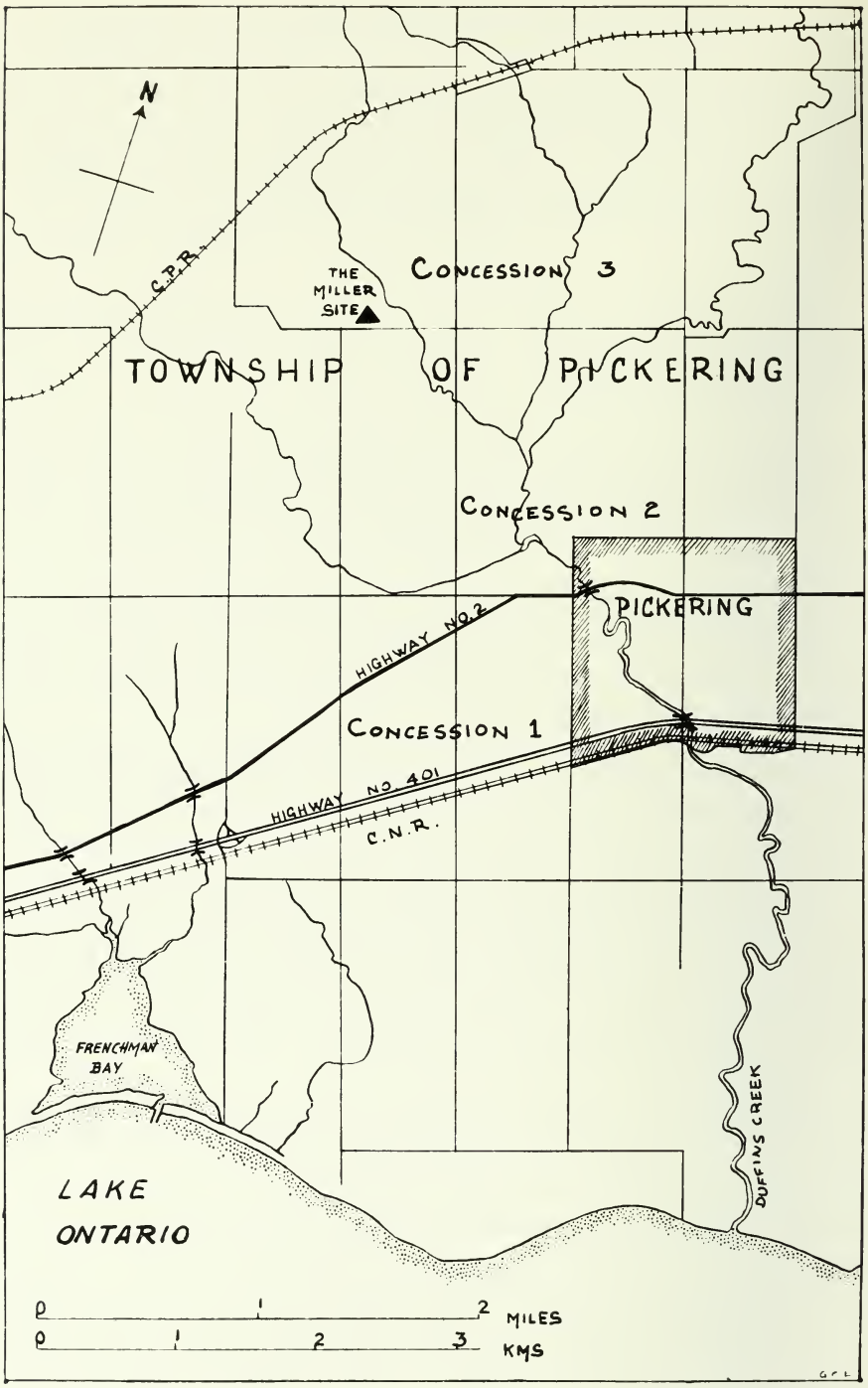

Figure 2 *The Miller Site*

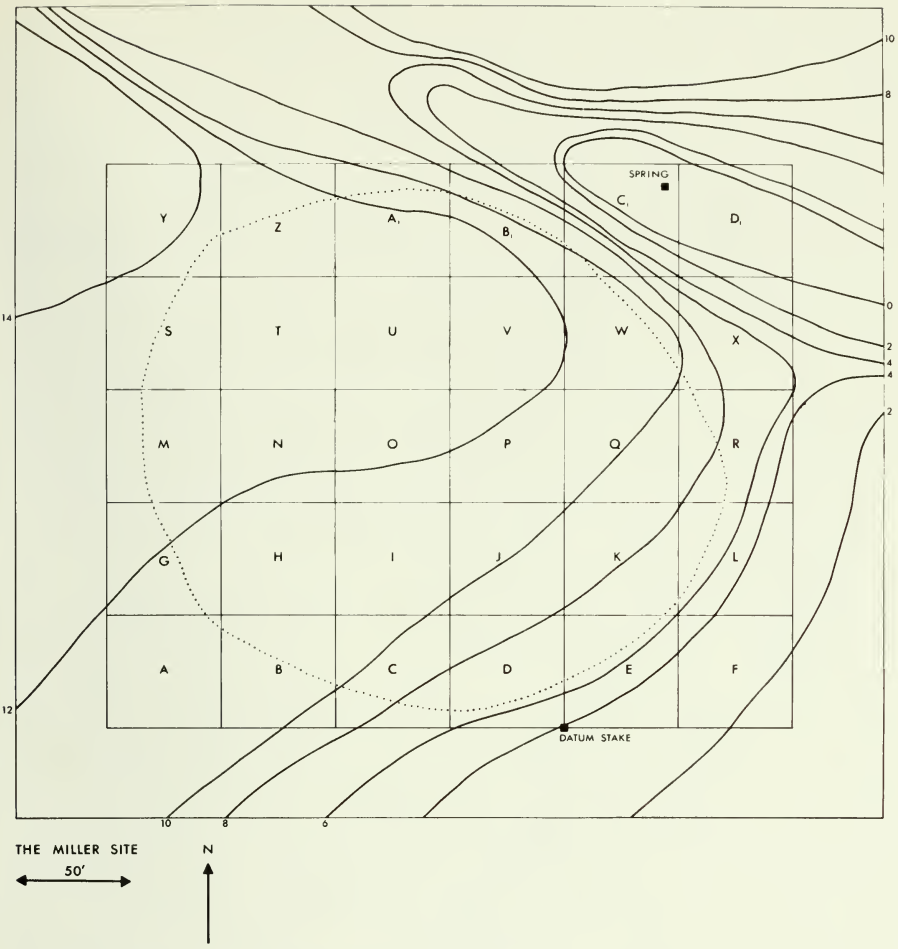

Figure 3 *Grid system and contour map*

the village completely, we attempted to follow the palisade line on both the east and west sides of the village, expecting them to meet at some as yet undetermined point to the north. For reasons which became clear only in the following season, we were unable to locate more than the southern half of the palisade at that time. As a result, we were forced to revise our strategy; we started stripping Area R, moving westward into the village itself.

Our knowledge of the village, at that time, was limited to such data as had been obtained from preliminary testing, from the excavation of the small midden to the north of the datum stake, and from the trenching operation which had been employed to locate the southern segment of the palisade. On the basis of this experience, it appeared that the site was largely sterile. That is, it appeared as though the refuse left by the inhabitants of the village would be concentrated in dumps or middens, and that there would be virtually no artifacts found between the middens unless a pit or hearth was encountered. On the basis of this assumption, we decided to remove the light,

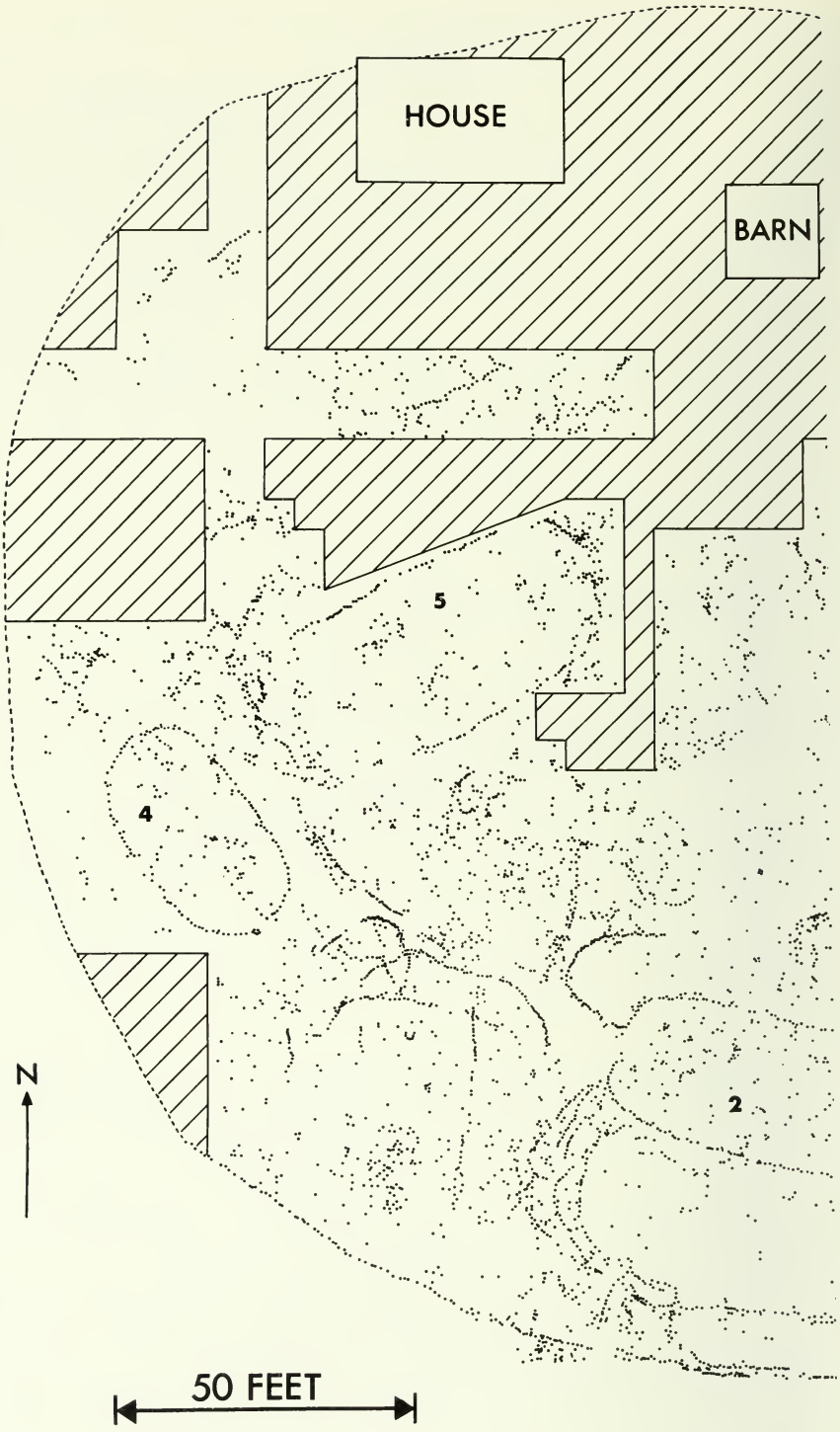

Figure 4 *Post-mould distribution, the Miller Site. Shaded areas are unexcavated*

6
1
3

sandy humic layer that had been ploughed, and to concentrate on locating and mapping post-moulds. The sharp colour distinction between the light, sandy soils revealed by testing and trenching, and the black sandy soil with its high organic and artifact content indicated that this was a safe procedure. While the very occasional specimen would certainly be missed, a slight change in soil colour would, at any stage in the stripping operation, indicate that we were approaching a hearth or midden. That is, we would use changes in soil colour to warn us that we were approaching some feature that would warrant closer investigation with a more refined technique.

When a feature — a pit or hearth, for example — was encountered, its position was recorded by measuring its location within the 50-foot area; post-moulds were originally graphed by the same method. Very early in the excavation, however, it was found that post-moulds could be recorded much more rapidly, and with at least equal accuracy, by using a plotting-frame. This was a five-foot wooden frame divided by light, strong cord into one-foot squares. When the corners of the frame were reinforced by L-shaped strips of iron, it was quite rigid, and gave us at least the same degree of accuracy as was achieved by triangulation. In practice, the 50-foot area units were subdivided into five-foot strips for plotting. The precise location of post-moulds within the foot square units of the plotting frame was not measured, but simply estimated.

Throughout the entire excavation, the system worked to our satisfaction. Any finer degree of precision would have required a tremendous outlay of time and money, but would have added very little, if anything, to our knowledge of the people who inhabited the village. For example, it is probably significant that burial pits occurred both inside and outside of the palisade. This information might prove to be of importance on some future excavation. The *exact* location of the graves, on the other hand, is probably not nearly so important, for it is certain that the inhabitants of the village did not use a tape and transit in locating any of their structures or features.

During the course of the excavation, we shifted many times from trowelling to screening, and then, concerned that we might lose some vital information, returned to trowelling. Approximately one-twelfth of the site was simply removed by shovel to the bottom of the ploughed zone; one-sixth, more or less, of the same stratum was completely excavated by trowel; the remainder of the site was shovelled through a screen with a one-quarter inch mesh. All work below the ploughed zone was done by trowel, except some general trenching in Area K. In that portion of the site, the sand was much more mottled than usual, and it was virtually impossible to detect the outlines of a pit unless there was a fair amount of ash or humus mixed with the pit fill. As a result, we decided to cut a trench through the area when all features had been excavated there to make certain that nothing had been overlooked.

Excavation was started at the eastern edge of the village. From there, we did not move steadily across the settlement, but tended to work in several different spots at the same time. This was necessary, because of the composition of the crew, as well as the nature of the work. Shovelling, screening and removal of backdirt was done mainly by high-school students with no pre-

vious training. Operations of a more technical nature — sectioning pits and hearths, plotting post-moulds and other features, excavating and removing burials and similar jobs — were performed by university students or people with previous experience. In practice, the division between junior and senior staff was not rigid; on the contrary, the two senior positions on the crew were filled by high-school students in 1961, the final year of excavation. We did have problems, however. Frequently, it was necessary to have the junior crew members begin work in another area in order that we might bring the more detailed work up to date. Usually, the "juniors" would either remove another five-foot strip from an area already under investigation, or would cut a five- or ten-foot trench into an unexplored region.

Generally, however, we worked across the site from the southeast or the northwest. Before discussing the various classes of data which were collected during the excavation, it might be appropriate to discuss one problem which we encountered, a problem which we struggled with for over three years, and which was never solved to our satisfaction. As we mentioned earlier, we were unable, during the summer of 1958, to follow the line of the post-moulds forming the palisade around the northern periphery of the village. The following season we re-examined the eastern and western ends of our curved trench and picked up the line of post-moulds with no difficulty. On this occasion, we were able to follow it completely around the settlement. It was fairly obvious, at this point, that the only variable that could account for the difference was the weather. That is, the post-moulds were clearly visible when the sand was damp; as it dried out, the organic stains became increasingly faint. The summer of 1959 was very hot and dry, and as a result, the post-moulds were extremely difficult to detect. The following summer there was more rain during the period when we were digging, and we could follow the line of post-moulds with very little difficulty.

Once we learned this, we utilized the knowledge to facilitate the excavation and recording. If the sand became too dry, we sprayed it after the humus stratum was removed, but before we trowelled down the floor of the area to locate and record the post-moulds. But what of the area that had been excavated prior to our discovery that the post-moulds stood out much more sharply when the soil was damp? In all probability, we missed some post-moulds in Area R. It is highly unlikely, however, that we missed anything significant.

Another major problem was stumps and roots. These increased markedly towards the north of the site and account for the gaps in the plan of House No. 1, for example. Although many individual post-moulds were certainly obliterated by root action, this loss of data did not obliterate any *patterns* in the post-mould distribution. An additional source of disturbance was the occasional hole dug by the farmer throughout the site. This was not serious, however, and it was extremely simple to separate out those holes dug by the farmer because the marks of a round-mouth shovel were clearly visible. More serious were the house and barn foundations located at the north edge of the village (fig. 4).

The Miller Site covers 1.05 acres, of which slightly over 75 per cent was dug. In addition to this, 1600 square feet outside of the palisade in Area R

were excavated. The total area excavated then was 47,675 square feet. As the average depth of excavation was nine inches, this means that something over 1,000 cubic yards of earth were moved.

During the process we recovered and catalogued 9,258 specimens plus 1,150 pounds of bodysherds. The artifact content of the site, therefore, was approximately 7.15 catalogued specimens plus 0.95 pounds of bodysherds per cubic yard.

The distribution of this material throughout the site was very irregular. Only one concentration which might be described as a midden was located. This small patch immediately north of the datum stake was probably a refuse heap before it was scattered by agricultural activities. No other concentration of this nature was found on the site. Ignoring for the moment the contents of pits and hearths, the concentration of artifacts and refuse was much higher on house floors than throughout the rest of the village. In the village itself, that is, the area outside of the houses but within the palisade, we also found that the distribution of artifacts was not uniform. Generally, the artifact content, here, decreased markedly as we moved across the village from southeast to northwest.

The distribution of post-moulds was much more uniform than the distribution of artifacts. Most of the post-moulds (fig. 4) did not form any discernible pattern, and no conclusions as to their purpose can be drawn. Figs. 3 and 5 present my abstractions from these raw data. These include the palisade which surrounded the village, and the six houses within it. The northern segment of the palisade was simply established as a line. No attempt was made to measure the location of each individual post-mould. This line is represented in fig. 3 by dashes. The enclosure to the south of House No. 2 might or might not be a dwelling. The absence of a patterned distribution of hearths within this structure would suggest that it was not a dwelling; nor were there any other features associated with it that might give us a clue to its function. A similar problem was encountered many times throughout this excavation. We would find a line of clearly defined post-moulds whose function still remains a mystery. Most of these lines were straight although some were curved with a radius similar to that of the end of a house or usually smaller. If the line was curved there was a marked tendency for the post-moulds to have a smaller average diameter, to be set more closely together and to be shallower than those lines which were straight.

Another group of post-moulds can be safely attributed to rebuilding. In this group, we could place the curved lines at the west end of the anomalous structure to the south of House No. 2, both ends of House No. 5, and House No. 6, which appears to have been completely rebuilt.

Thirty-two pits were located and excavated throughout the site. These, with the possible exception of that in House No. 1, might more accurately be described as "disturbed areas" measuring from four to six feet in diameter, and from 18 to 30 inches in depth. Generally, and apart from graves, it was impossible to assign a function to the pits. Because the artifact content within the pits was no higher than that of the richer areas of humus, they can hardly be described as "refuse pits." They may have been used as "storage pits," but there is no evidence in support of this supposition. Although

most of the charred corn from the site was found in hearths and pits, it is very likely that the entire humic layer contained a large quantity which was subsequently destroyed by cultivation. The fact that most of our cereal refuse is from pits must be attributed, therefore, to the more favourable conditions for preservation below the ploughed zone.

Burial pits (fig. 5) are less anomalous, although here, also, no clearly defined pit outline was generally visible. The only exception was Burial No. 1, where some accurate measurements were obtained. With the remaining burials, traces of the pit outlines were extremely vague and indistinct. Burial No. 3, for example, might be interpreted as a single grave containing multiple secondary burials; on the other hand, it could with equal validity be interpreted as two superimposed secondary burials. The distribution of graves throughout the site can be described only as random. They occurred both inside and outside the palisade, and one, Burial No. 7, was inside House No. 5.

Fish, bird, mammal and turtle bones were also widely scattered over the site. As with charred corn, however, these were more plentiful below the plough line, which we again attribute to differential preservation.

III *Features*

Fig. 4 is the basic plan of the excavation. It shows the distribution of post-moulds encountered throughout the excavation, including the palisade, and the location and size of the house and barn foundations near the northern edge of the village. Those areas which are cross-hatched represent the unexcavated portions of the village. The dashes marking the northern and western portions of the palisade indicate the line of the palisade, not individual post-moulds. Piles of backdirt, trees and stumps made it impossible to use the plotting-frame on this portion of the palisade with the same degree of accuracy that was achieved in other areas. As a result, we subdivided the basic 50-foot grid system into 25-foot squares, then graphed the points where the palisade cut the 25-foot lines.

PALISADE

The palisade surrounding the village was built of light poles averaging 3.5 inches in diameter and ranging between 2.25 and 9.0 inches. Although the palisade was quite irregular (see fig. 4), the posts averaged slightly under one foot apart, centre to centre, and were set approximately 22 inches into the ground. Within the range of post diameters mentioned above, there was some variation. Most of the posts were about 3 inches in diameter, but at irregular intervals a larger post, or posts, would be placed, presumably to give the structure greater stability. No evidence of digging was encountered in connection with the palisade. On the other hand, post-mould sections revealed that at least some of the posts were sharply pointed. We conclude,

therefore, that the palisade posts were simply sharpened and then driven into the ground by hand. Experiments showed that it was not only possible to drive a post into the ground to a depth of two feet by this method, but that it was also more efficient than digging. This is particularly true when the sand is moist.

No positive evidence of a gate or entrance to the village was found. The southern segment of the palisade was largely intact and it is highly unlikely that an entrance was located there. The northern segment had a number of small gaps, but in that region there was much disturbance associated with the house and barn foundation (fig. 4). There was also a variety of stumps and roots which complicated the excavation. In all probability, the entrance to the village was situated somewhere along the northeastern segment, but was not definitely located.

HOUSES

The post-moulds which formed the outline of the houses were characteristically smaller, closer together and shallower than those which formed the palisade. The average diameter was 2.9 inches with a range of from 2.25 to 4.0 inches. In depth, they ranged from 14.0 to 20.5 inches with an average of 17.3 inches. The small range of post diameters is probably significant. It indicates that the builders made a definite selection for size. That is, they knew exactly what they wanted and selected posts which had the required characteristics. They were probably interested in long, slender and flexible poles which could be set into the ground to form an oval, then bent over and lashed together, forming a low, elongated dome. The nature of the covering material is not known, but was probably bark. Experiments demonstrated that it is quite possible to cut saplings of the required diameter, to set them 24 feet apart and still bend them over to form a dome at least seven feet high. For this purpose, however, only deciduous trees were suitable.

Houses Nos. 1, 2, 3 and 5 (fig. 5) are fairly uniform in size. House No. 4 and House No. 6 were somewhat shorter and proportionately wider than the others (Table I). The structure to the south of House No. 2 (fig. 4) is not included in our discussion of houses because of its different shape and lack of internal, patterned hearths. No conclusion as to its function has been reached. The six remaining structures, however, could only be multi-family dwellings. Each, so far as could be determined, was characterized by a door at one end only, an irregular line of poorly defined hearths down its centre and an absence of other internal structural features.

House No. 1 (fig. 5) is 55.5 feet long and 27.0 feet wide. Like all of the houses at the site, it can best be described as a flattened oval. Its floor area is 1148 square feet. An irregular line of central hearths was manifest mainly as a series of burnt sand areas, although ash and charcoal were associated with each of these. A sixth fire in the southwest corner of the house is not included in this discussion because its position suggests that it might not be contemporaneous with the structure itself. The remaining five fires did not have clearly defined boundaries. They can best be described as irregular in

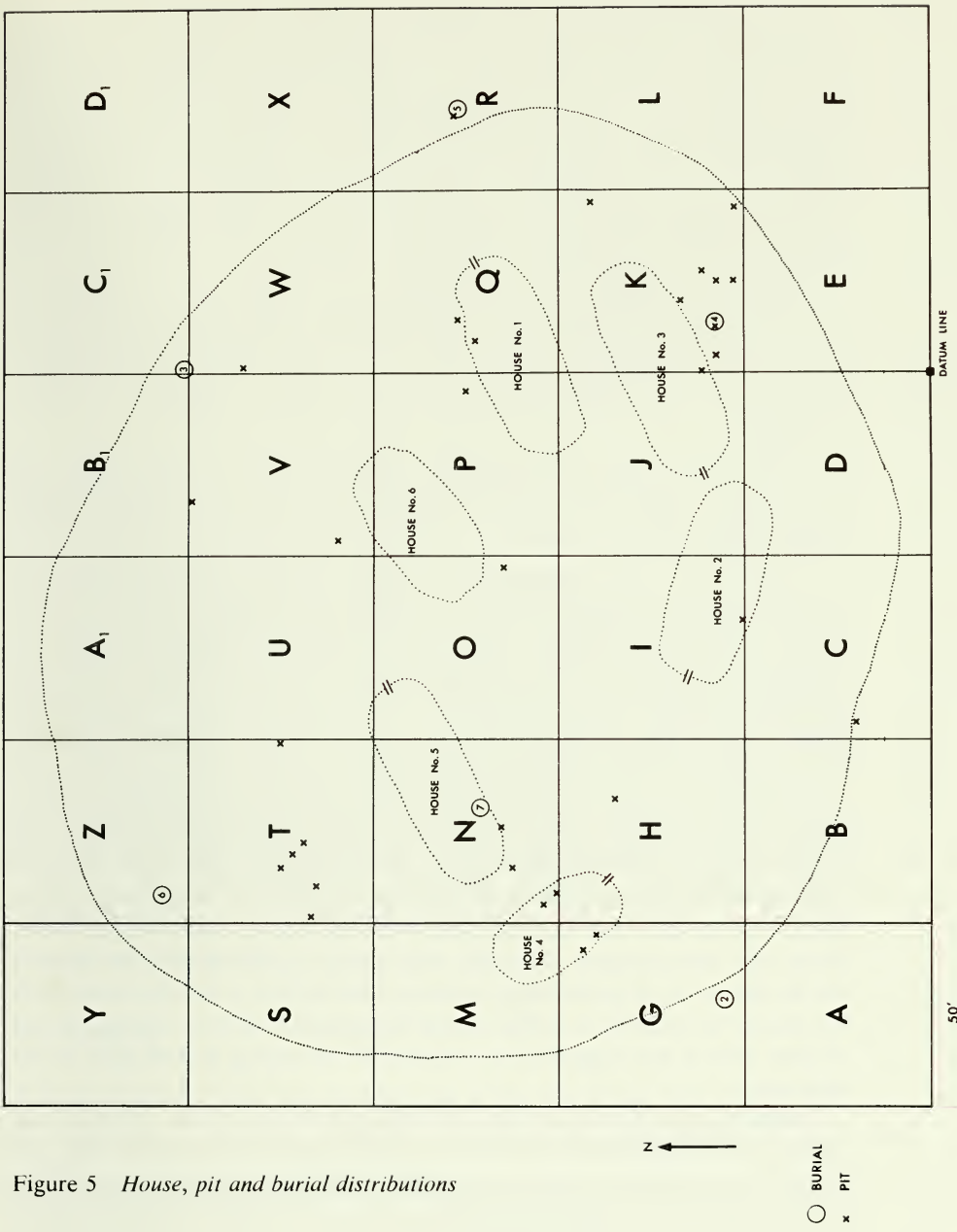

Figure 5 *House, pit and burial distributions*

outline, suggesting that fires had been built a number of times in approximately the same spot. Scattered around each of the fires was a myriad of very small, shallow post-moulds. These are certainly associated with the fires and are probably the remnants of devices used in connection with cooking. They might have been frames for suspending cooking pots over the fire, or spits for cooking meat or fish.

The irregularity of the hearth outlines suggests that they had been used continuously for some fairly long period, then after a considerable interval were again used continuously for a long period. In our own field-camp at the site, we produced a feature with a similar lack of definition when we built a camp fire on two successive summers, in such a manner that the fires overlapped but were not coterminous. Because we found more burnt sand areas outside the houses than within them, and because of the suggestion of repeated use of the house fires with fairly long intervening periods, it is very likely that cooking was done outside in the summer.

House No. 2 (fig. 5) was 57.5 feet long and 23.7 feet wide and enclosed an area of 1223 square feet. The line of central hearths in this structure was much more irregular than that in House No. 1 and, therefore, more difficult to interpret. It is almost certain, however, that this too was a five-fire dwelling.

House No. 3 (fig. 5) was 60.3 feet long, 23.1 feet wide and had a floor area of 1257 square feet. Although we encountered the same problem in interpretation here that we faced with House No. 2, this, also, was probably a five-fire house.

House No. 4 (fig. 5) exhibited less lateral flattening than did the other structures, and is therefore broader in relation to its length. It was 38.1 feet long, 20.6 feet wide and had a floor area of only 618 square feet. This was definitely a two-fire house. If my interpretation of the fires in the other dwellings is correct, then House No. 4 was not occupied as long as the others. The fires in this house had more clearly defined borders suggesting that they had not been rebuilt so many times.

House No. 5 (fig. 5) was 57.5 feet long, 20.6 feet wide and enclosed an area of 1074 square feet. The pattern of hearths and burnt sand in this structure was the most irregular that was encountered at the site. An entire strip of burnt sand extended almost the full length of the house. While I decided in the field that this, too, was a five-fire house, there is some doubt about this interpretation. It could, with almost equal validity, be called a six-fire house. In all probability, however, this too was a five-fire house with the greater irregularity in outline caused by repeated use over a longer period of time. This is also suggested by evidence of rebuilding at both ends of the structure.

House No. 6 (fig. 5) was 45.0 feet long and 25 feet wide, and enclosed a floor space of 850 square feet. It is perhaps worthy of note that House No. 6 was discovered in the office rather than in the field. This portion of the site was excavated as a series of five-foot strips, with long intervals of time between them, rather than as a unit. As a result, I had no clear overall impression of the distribution of post-moulds in this area, particularly as many of the markers were removed as soon as they were mapped, in order to investigate a series of stains and burned patches. It was only in the laboratory, when I combined the maps of adjacent areas to construct the post-mould distribution map (fig. 4), that I first became aware of the existence of House No. 6.

This house appears to have undergone extensive rebuilding, but without altering its original plan. Because of the rebuilding, however, all traces of a

Table 1

MILLER SITE—HOUSES

House No.	*Length (in feet)*	*Width (in feet)*	*Area (square feet)*	*No. of Fires*
1	55.5	27.0	1148	5
2	57.5	23.7	1223	5
3	60.3	23.1	1257	5
4	38.1	20.6	618	2
5	57.5	20.6	1074	5
6	45.0	25.0	850	?
TOTAL:			6170	

door have been obliterated. Nor was it possible to establish the number of hearths that the structure contained. The entire area was a mottled red, suggesting that innumerable fires had been built there at some period, probably both during and after the period of occupation.*

In addition to the palisade and house patterns already described, a third pattern of post-moulds emerged quite clearly. Although no purpose can be assigned to these features, they were quite distinct. During the last month of excavation when we had gained considerable experience in interpreting the post-mould patterns, we could see and interpret them as they were being exposed. The individual posts here were obviously smaller and set more closely together than those of either the palisade, the houses or the anomalous structure to the south of House No. 2. Analysis revealed that the individual posts in these features had an average diameter of 2.0 inches, a range of from 1.25 to 2.5 inches and an average depth of 12.05 inches. They were spaced an average of 4.1 inches apart, centre to centre, and formed curved lines of irregular length.

BURIALS

A total of seven graves was encountered at the site. These were widely scattered (fig. 5), occurring both inside and outside the palisade, with one, Grave No. 7, located within House No. 5. Grave No. 1, the original discovery which led to the location of the site, was seriously disturbed prior to our arrival. Pottery fragments in the grave-fill link the grave unmistakably with the adjacent village, however. Parts of 13 different individuals were removed from the pit.

*Much of the confusion regarding the number of hearths at the site can probably be attributed to the fact that any fire built on the surface would stain the underlying sand a deep orange. This occurred wherever the inhabitants of the village built a fire. But it occurred, also, wherever the original settlers built a fire. The picture was complicated further by the fact that the area has long been a favorite picnic and camping spot. During the excavation it was usually impossible to attribute a hearth to a particular one of the three groups of people which have built fires at the Miller Site.

Grave No. 2 (Plate 1) was located in Area G, while we were following the palisade along the western edge of the village. The grave was extremely shallow — approximately 21 inches — with the upper parts of one cranium being within the ploughed humus. In outline the burial pit was a faint, irregular oval with a major diameter of 2.5 feet. Three bundle burials were contained in the pit — a male, a female and a juvenile. The bones from the three bodies had probably been contained in a single wrapping. No grave-goods were present. At least three different segments of vertebral columns were articulated, indicating that at least some tendon or cartilage was present at the time of the second or final burial. The tip of a flint projectile point was embedded between a fourth and fifth thoracic vertebrae. From its position, it would appear that the arrow (or spear) penetrated the individual from the front and well to the left of the medial line. The projectile, then, would have pierced the thoracic cavity and was almost certainly the cause of death.

Grave No. 3 (Plate 2) contained parts of the bodies of four individuals — a mature male, another adult of undetermined sex and two juveniles. The oval grave was 2.3 feet deep with vertical sides and a major diameter of three feet. It is almost certain that this burial pit had been opened more than once. The floor of the pit was covered with a thin layer of disarticulated carpals, tarsals, phalanges, vertebrae and ribs. Above this, and separated from it by a one- to four-inch lens of clean, sterile sand, was a single bundle containing major parts of the two adults and the older child. The bundle was at the western edge of the pit.

Grave No. 4 (Plate 3) contained portions of an adult male and female, another adult of indeterminate sex, and one child. The outline of this grave was not visible until its excavation was virtually completed, when an oval stain with a major diameter of 23 inches was encountered. The bones were found quite by accident while we were excavating a pit which had been superimposed upon the north edge of the grave. The bones were rather widely scattered and were probably the remnants of a disturbed bundle burial (Plate 3).

Grave No. 5 (Plate 4) was a shallow pit with an outline so indistinct that it could not be recorded. In this grave was found the only primary burial located at the site. On the floor of the pit was found the tightly flexed body of an elderly female placed on her back and heading northwest. About six inches north of her head was the single pubic bone of a child. This bone was actually beyond the extremely faint line which I had previously decided was the limit of the grave. With the female was a single left patella of another adult individual and part of another child. Sex could not be determined. No grave-goods were present.

Grave No. 6 again contained parts of three different individuals, again those of a mature male and female and a child. Most of the bones from the three individuals were missing. Present, however, were two mature left tali and two right patellae. One of each was very large; the others were very small. Although we cannot be certain, this difference probably reflects sexual variation. Present, also, was the proximal epiphesis of the left humerus of a young child. In addition to these was a variety of hand and foot bones, some

rib fragments and two cervical vertebrae.

Grave No. 7 contained only a number of terminal phalanges and two seriously decayed teeth of an adult.

Table 2

CONTENTS OF BURIAL PITS

Burial	*Adult Males*	*Adult Females*	*Adult ?*	*Adolesc. 12–20*	*Juv. –12*	*Total*
1	3	3	—	4	3	13
2	1	1	—	—	1	3
3	1	—	1	—	2	4
4	1	1	1	—	1	4
5	—	1	1	—	2	4
6	1	1	—	—	1	3
7	—	—	1	—	—	1
	—	—	—	—	—	—
TOTAL:	7	7	4	4	10	32

PITS – 32

Apart from post-moulds, features at the site were numbered, by area, in the order in which they were located. They were simply recorded as, for example, "Area B — feature with centre at 10′S. 13′E."* Once the feature had been identified, it was then referred to by name and number. Thus we have House No. 4 and Burial No. 6, both of which had previously been assigned different designations. With houses and burials, no difficulty was encountered; these were definite entities, and could be readily identified as such. Even the peculiar structure to the south of House No. 2 presented no great problem. In the field, we simply referred to it as the "annex."

Pits and hearths were a different matter. They were first observed simply as discolorations in the generally sterile sub-soil. We knew that they should be recorded and investigated, but usually had no clue as to what that investigation would disclose. Usually, it was nothing more than a stain, probably caused by leaching of the overlying stratum. On one occasion it was the body of a domestic sheep.

Frequently, however, we would find a small pocket of sherds, ash and bits of stone, surrounded by a stained area. This stain was sometimes an irregular reddish patch, indicating intense heat, and sometimes an equally irregular greyish-black patch, probably caused by leaching.

These were most likely the remnants of shallow, saucer-shaped depressions that had once contained cooking-fires. But cultivation had long since destroyed most of the evidence which might have led to their identification. In many instances, these shallow pockets might have been nothing more than

*Measurements within the area units are taken at right angles from the nearest or most convenient edge.

slight irregularities in the surface of the ground, irregularities which became filled with village refuse and which, as a result, were beneath the cultivated stratum.

A total of 32 pits (fig. 5) were recorded during the excavation at the Miller Site. At least twice that number of suspected pits was investigated but with inconclusive results. Large areas, particularly in Area K, can be described only as having been disturbed (cf. Greenman, 1937:24). Extensive trenching produced no clues as to the reason for the disturbance. I am not sure even that the disturbances can be attributed to the Indians. The 32 recorded pits, however, are discrete entities even though the limits of the pits were not always precise. In plan view, they were slightly oval, with major diameters ranging between two and eight feet. Maximum depth was three feet.

Because the relative density of artifacts within the pits or disturbed areas was usually no higher than that of the richer humic areas, they cannot be called "refuse-pits." If they were storage pits, evidence of that purpose has long since vanished. Nor had they been used as cooking or barbecue pits because there is no suggestion that a fire had ever been built in any of them.

Although neither the distribution nor the contents of these pits added much to our knowledge of the people who inhabited the village, they did serve a useful purpose. The fact that they extended below the plough-line meant that the artifacts they contained had not been broken up by cultivation. This enabled us to examine refuse as it had been left by the inhabitants, and thus to draw more reliable conclusions regarding their cultural behaviour. For example, it was noted that complete long-bones of the larger mammals were virtually absent from the site. Lacking other evidence, and knowing that the area was under intense cultivation for many years, we might have concluded that these objects had originally been present, but had subsequently been broken up by agricultural activities. The fact, however, that this absence of complete long-bones from the large mammals is noted in the pits as well as in the humic stratum supports the conclusion that large mammals were not a significant element in the diet of the people. We might conclude, further, that on those rare occasions when a large mammal was taken, the people were extremely careful to break up the bones so that every scrap of marrow could be extracted.

In addition to enabling us to estimate the amount of fragmentation of specimens that could be attributed to cultivation, the pits served another very useful purpose. The sample of artifacts from a single pit was assumed to represent a shorter time-span than that occupied by the entire village. If, therefore, there had been any significant changes in ceramic styles during the period that the village was occupied, our only hope of detecting that change lay in the comparison of the artifact content of the various pits. Such a comparison was made, and with totally negative results.

Two of these pits will be described in some detail: the first (in Area V, with centre at north, 10.0 feet; east, 3.0 feet) was an oval pit with a major diameter of 8.0 feet and a minor diameter of 5.0 feet. With almost vertical sides and a flat bottom, it was not quite three feet deep (fig. 6). Its contents were as follows:

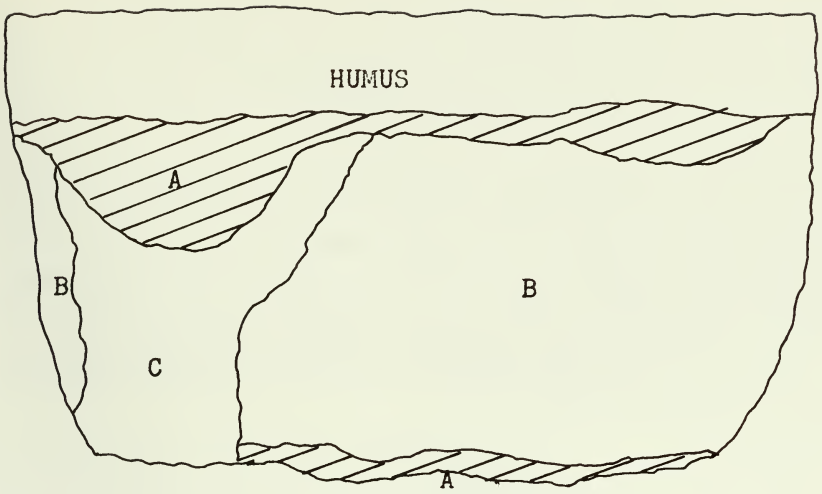

Figure 6 *North-south section through pit, Area V*
Scale 1:12
A. Dark brown sand and charcoal
B. Light brown mottled sand
C. Medium brown mottled sand

CONTENTS

CERAMIC	2 pipe-stem fragments
	1 pipe-bowl fragment
	1 gaming disc
	2 lumps fired clay
	19 rimsherds
STONE	9 hammer and anvil stone fragments
	1 flint nodule
	4 flint flakes (unmodified)
	2 flint scrapers
	4 ground slate fragments
	1 bone awl
	1 worked bone fragment
FISH	75 ribs and spines
	34 vertebrae
	20 fish-scales
	8 gill covers
	40 miscellaneous fragments
TURTLE	2 fragments
MAMMALIA	29 long bone fragments
	6 vertebrae
	5 rib fragments

12 cranial fragments
5 teeth
10 miscellaneous fragments
4 mandibular fragments

The second, an irregular circle in plan view, had a north-south diameter of 6.9 feet and a maximum depth of 2.5 feet. It was located in Area N, with its centre at 4′6″ E. and 3′2″ N. Below the 6-inch cultivated surface stratum, it consisted of two equal strata. The lower was a light, mottled sand, blending into an upper stratum of dark, ashy sand. Near the centre of the pit, at a depth of 2.0 feet, was found a complete ceramic pipe (Plate 30, No. 1).

In addition to the pipe, the following material was found uniformly scattered throughout the pit fill:

CERAMICS	2 pipe fragments
	39 rimsherds
	715 bodysherds
STONE	6 flint flakes
	4 hammer-stone fragments
BONE *(Mammalia)*	1 pelvic fragment
	3 long-bone fragments
	1 maxillary fragment
	4 beaver teeth
	2 vertebrae
	7 miscellaneous fragments

The contents of these two features is typical of the larger, richer pits from the site, except for the absence of fish-bones in the latter. In the first pit, the 19 rims represent a minimum of 13 different vessels; in the second, the 39 rims were derived from at least 30 different vessels.

The second pit described was located within House No. 4 and on the right side of a person entering the dwelling. This should probably be considered a structural feature of the dwelling, as a similar feature was found in three of the other houses (though not in the anomalous structure to the south of House No. 2). With the exception of House No. 5, these pits or disturbed areas were very close to the right-hand wall of the structure and never in the back half. House No. 5 and House No. 6 both lacked this feature.

IV *Artifact Analysis*

STONE ARTIFACTS

Hammer and Anvil Stones – 61

Hammer and anvil stones were widely scattered throughout the site, but there was a much higher concentration in some pits. This may be the original distribution but, in all probability, it is not. It is much more likely that the

farmer removed many of the stones from the surface when he was working the soil. In any event, we found 43 complete hammer and anvil stones during the excavation, and 18 fragments. On the complete specimens, evidence of use was distributed as follows: 27 specimens had been used on both ends and both sides; seven had been used on both ends and one side only; eight exhibited evidence of use only on the ends. The remaining specimen was a round, faceted pebble whose entire surface was pecked.

The majority were of granite, although quartz, quartzite and limestone were also used. They were all water-worn and could have been obtained either from the beds of neighbouring streams or from local gravel deposits. The largest specimen was a granite cobble with a major diameter of 12.5 cm.; the smallest was a quartz pebble with a similar diameter of only 28 mm.

Whetstones – 65

The excavation produced a total of 65 whetstone fragments. None was complete, but all bore unmistakable evidence of having been used to sharpen stone and bone tools and weapons. Several specimens have neatly smoothed edges, suggesting that the person who used the stone had not been satisfied with a simple slab, but had taken the trouble to shape it into some convenient or traditional form. Forty-four of the specimens were sandstone; the remaining 21 were slate. Three of the sandstone specimens each had one or more water-worn surfaces, indicating that at least some of the material used for whetstones, like that employed for hammer and anvil stones, had been picked up in a stream bed or on the old raised beach to the north of the village.

Adze Blades – 32

Adze blades from the site are poorly finished, as a rule, and range from 6 to 13 cm. in length. Thirty-two specimens are included in our sample, represented mostly by bit ends, although five (Plate 6, Nos. 1-5) are complete. This group is fashioned entirely of schist. An additional 31 fragments of schist and slate were found. These, however, could not be identified. They were simply noted as being out of their natural geological context.

The method of manufacture, like the material, is that commonly found in surface collections from southern Ontario. A stone of the approximate size and shape of the desired tool was selected, then pecked roughly into shape. Final grinding of the bit end gave it a sharp cutting edge.

Stone Disc – 1

This specimen, fashioned from gneiss, is approximately half of a wheel-like object some 8 mm. thick, 18 cm. in diameter, and with a central hole measuring 2.4 cm. in diameter (Plate 5). The outer edge has been chipped and subsequently smoothed lightly; the central hole was pecked from both sides of the object, and this also exhibits light smoothing. This light smoothing may have resulted from use of the object, although its function cannot be deduced from its form. The possibility that it was a spindle-whorl is intriguing, but difficult to support. Similar objects, to the best of my knowledge, have not been reported in Ontario or even in neighbouring areas.

CHIPPED STONE ARTIFACTS

Apart from modest quantities of chipping detritus, the excavation produced a total of 393 chipped stone artifacts (Table 3). The most popular material for chipping was a mottled, bluish-grey chert.

Table 3

CHIPPED STONE ARTIFACTS

Side-scrapers and Utilized Flakes	269
Projectile Points and Fragments	89
End-scrapers	29
Drills	4
Blades	2
TOTAL:	393

Side-scrapers – 269

Of the chipped stone specimens, over 68 per cent are side-scrapers and utilized flakes (Plate 7, Nos. 10-16). The majority of these show very little evidence of having been shaped. Usually they are irregular in outline, and sharpened with crude chipping along one edge only. These tools were probably used for a variety of purposes, much as modern man will use a jack-knife or a hunting-knife.

End-scrapers – 29

End-scrapers, on the other hand, are much less crude (Plate 7, Nos. 1-9) and, also, much less plentiful. These specimens are invariably fashioned from flakes, tend to be thicker, and were probably shaped to some functional end. Usually, they have a steep, finely chipped cutting end.

Projectile Points – 76

Projectile points and fragments from the site consist of 41 complete specimens, 25 tip fragments, 13 basal fragments and 10 blanks, that is, incomplete or rejected artifacts. If the 13 basal fragments are subtracted from this sample, it is found that the smallest number of points and fragments which could provide this assemblage is 76. For analytic purposes, on the other hand, the significant specimens are limited to the 41 complete points and the 13 bases — a total of 54.

Of these, 21 (38.8 per cent) appear to be variations on a simple isosceles triangle (see Plate 8, Nos. 1-15). Several of these (e.g. Nos. 1-4) have slightly excurvate sides and a vaguely rounded base, suggesting that this class of "triangular" points may have to be subdivided in the future. At present, however, it is probably wiser to group them, and to contrast this group with the remaining 33 points which are notched and stemmed. The triangular points range from 2.8 to 5.1 cm. in length, and from 1.2 to 2.2 cm. in width. A more precise statement regarding the proportions of the specimens is obtained by dividing the length into the width. This index was tabulated for

the 15 points illustrated on Plate 8, and the results are presented there. The point which is broadest in relation to its length is No. 7, with an index of 0.86. No. 15, with an index of 0.33, is the narrowest in relation to its length. Those specimens which are not illustrated all fall between these extremes.

The 33 stemmed and notched points (see Plate 9) range in length from 2.1 to 7.6 cm., and in width, from 9 to 29 mm. As a group they are very crudely made, exhibiting wide variations in form, size and workmanship. Ten of the specimens are stemmed; the remaining 23 are side-notched.

Flint Blades – 2

One pear-shaped blade (Plate 10, No. 10) and one oval blade were excavated at the site. The former has a major diameter of 5.8 cm. and a minor diameter of 4.2 cm. It is 7 mm. thick. Corresponding measurements for the latter specimen are 4.6 cm., 3.4 cm., and 1.3 cm. These could be classified either as knives or scrapers.

Flint Drills – 4

Four very crudely made flint drills complete the chipped stone inventory. Ranging in length from 1.5 cm. to 4.3 cm., they all have flat, expanded bases and all exhibit the indifferent workmanship that is characteristic of both polished and chipped stonework from the site.*

BONE AND SHELL ARTIFACTS

Bone Awls – 35

The most frequently encountered bone artifact at the site was the awl, usually fashioned from a splinter of long bone. Although both bird and mammal bones were present, the majority were manufactured from mammal bones.

The smallest complete specimen (Plate 11, No. 5) was made from the distal end of the left tibiotarsus of a common loon, and measured only 4.2 cm. in length. The largest (Plate 11, No. 10) was 14.4 cm. long.

Another complete specimen (Plate 11, No. 6) was 10.3 cm. long, and was fashioned from the proximal end of the right radius of a bear.

Bone Needle – 1

The only needle produced by the excavation is a finely worked specimen 10.5 cm. long (Plate 11, No. 7). Oval in cross-section and with a major diameter of 8 mm., it has an eye 6 mm. from the base. The eye, which is circular, and drilled from both sides, is 1 mm. in diameter.

Fish Spines

Throughout the excavation, a number of dorsal and pectoral spines from various fish were found. Usually these were unmodified, suggesting that they

*Stone artifacts from the site are of such poor quality, generally, that the feeling is almost inescapable that the excellent specimen on Plate 10, No. 11, must have some alien origin.

were simply dietary refuse. In many instances, however, the tip of the spine was highly polished, as though it had been used. A few of the spines had been definitely modified (Plate 10, Nos. 5-8), and placed in Burial No. 1. These were all pectoral spines from channel catfish. No clue as to their purpose was found. Possibly they were used as awls, as is suggested by the high polish on some of the tips, or possibly they were points from composite fish hooks.

Harpoons – 3

The only relatively complete harpoon found at the site was removed from Burial No. 1, where it had been placed as grave furniture. Fashioned from the long-bone of a large mammal, it is 15.5 cm. long and 2.3 cm. wide at the base (Plate 12, No. 3). It is unilaterally barbed, with a line-hole 4 cm. from the base. The line-hole was gouged from both sides, is lenticular in outline and is approximately 2 mm. wide and 3 mm. long.

The remaining two specimens which are classed as harpoons are tip fragments only. One (Plate 2, No. 8) is unilaterally barbed, measuring 3.2 cm. in length; the other, bilaterally barbed (Plate 2, No. 7), is 4.8 cm. long. Both are fashioned from mammalian long-bones.

Bone Points – 2

Only one complete bone point was found at the site (Plate 12, No. 6). Excavated from the floor of House No. 3, it is 6.3 cm. long, 1.2 cm. wide and 3 mm. thick.

The other bone point (Plate 12, No. 4) was probably a shorter, broader specimen some 3.5 cm. in length. In its present form, it is 2.9 cm. long, 1.4 cm. wide and 2 mm. thick.

Bone Beads – 1

A single bone bead, 2.4 cm. long, was fashioned from the long-bone of a relatively large bird (Plate 13, No. 3).

Bone Pottery Markers – 2

Both of the pottery markers are merely fragments, but both produce designs on plasticine which were duplicated on the pottery from the site.

The larger fragment (Plate 12, No. 2) is 6 cm. long, 9 mm. wide and 6 mm. thick with notches along the one edge only. In cross-section, it is oval.

The smaller fragment (Plate 12, No. 1) is a chip of bone with three small projections along one edge.

Conical Points – 1

A single specimen of what is probably an unfinished conical antler point was found during the excavation (Plate 12, No. 9).

It is 4 cm. long, slightly oval in cross-section, and has a maximum basal diameter of 1.4 cm.

Worked Teeth – 2

The lower left canine of a bear (Plate 13, No. 8) has a shallow groove

encircling the root on three sides; the buccal surface is unmodified. This specimen, which is 7.2 cm. long, was probably grooved for suspension.

The other worked tooth is also a bear canine, probably the lower right, from a smaller and younger animal. Ground flat on its lingual surface, and with a flattened and pointed crown, it was probably used as a graving-tool or burin. It is 4.8 cm. long.

Shell Pendant

Too worn to be identified beyond the fact that it is a salt water gastropod, this specimen is 2.5 cm. long and has a maximum diameter of 1.2 cm. (Plate 13, No. 7). A very small, tapered suspension hole is located near the aperture.

COPPER AWLS

Rectangular in cross-section and pointed at both ends, the two specimens are 6.8 and 7.0 cm. long and both have a major diameter of 4.0 mm. (Plate 10, Nos. 1 and 2).

BEADS

Copper Beads – 7

All of these specimens were made by rolling up small strips of copper which were less than 2 mm. thick (Plate 13, Nos. 1, 5 and 6). Joints were invariably of the "overlapping" rather than "butt" type. In length, they ranged from 6 to 16 cm.; in diameter, from 4 to 11 mm.

Ceramic Beads – 3

One of these (Plate 13, No. 9) is an irregular ball of the same clay and tempering that was used in the manufacture of vessels. With an average diameter of about 1.8 cm., it had been moulded around a cylindrical object, possibly a bird bone or reed, with a diameter of 3 mm.

The other two ceramic beads were made from broken pipestems with tapered sides and a flattened upper surface. The only complete specimen (Plate 13, No. 4) is 1.9 cm. long. The incomplete specimen (Plate 13, No. 2) has an encircling groove to mark the spot at which it was to be broken off and polished.

Shell Beads – 2

Fashioned from the columella of a conch, these specimens are 17 and 20 mm. long and are both 8 mm. in diameter. When found, they were alternately strung with copper beads (Plate 13, No. 1).

GAMING DISCS

A total of 21 circular discs, both ceramic and stone, were found. Usually referred to as "gaming discs" or "counters," they ranged from 2.4 cm. to 5.0 cm. in diameter, and from 2.0 mm. to 1.3 cm. in thickness (Plate 14, Nos. 1-6). Two of the specimens were stone; the remaining 19 were made by grinding smooth the edges of potsherds.

Of the 19 ceramic specimens in the sample, nine are perforated with a small, tapering hole that was drilled from both sides of the disc; four had been drilled from both sides with the same tapered instrument, but the holes were not sufficiently deep to perforate the discs; a single, incomplete (?) specimen has an incipient perforation on one side only. The remaining four specimens, like both of the stone discs, are imperforate.

CLAY BALLS

Two clay balls, 1.2 and 1.5 cm. in diameter, were found (Plate 14, Nos. 7 and 8). Fashioned from the same clay and tempering that was used in the Miller Site vessels, these may have been toys. There is an equal probability, however, that they may have been used as pellets in a turtle-shell rattle.

TURTLE-SHELL RATTLES

What is probably part of a turtle-shell rattle was found in a pit in Area K. Measuring 11.2 cm. in length, it is the plastron of a Blanding's turtle *(Emydoidea blandingi).* The four small tapered holes near the middle of the specimen were drilled from the bottom surface of the plastron; a pair of similar holes was drilled near the broken end, a segment of one being visible in the photograph (Plate 14, No. 9).

CERAMICS

Pottery fragments from the Miller Site make up the overwhelming majority of the artifacts. In colour, the fragments range from light brown to black. In hardness, as measured on Mohs' scale, they fall between 2 and 3. Tempering consists of quartz, shell, mica, hematite, feldspar, plagioclase and microcline, with quartz predominating, and shell being present in such small quantities that it can be listed only as a trace-element. Particles measuring up to 4.5 mm. were encountered, but generally, they were under 1 mm.

An attempt was made to determine the ratio of tempering material to clay. No satisfactory method of separating these two materials was found, however; nor was it possible to determine the ratio through the specific gravity of the constituents because the ranges overlap. Reasonable results were finally obtained only by experimentation. Bodysherds were first soaked in water, and then brushed with a wire brush to expose the tempering (Plate 15, Nos. 1 and 2). Second, a series of mixtures was made with clay and coarse sand mixed in various ratios by volume. When dry, these too were brushed to expose the tempering, and then compared by inspection with the Miller Site sherds. It was found that the most similar sherds consisted of a mixture of from 2 to 3 parts clay to 1 part tempering by volume.

Identification of tempering material in the sherds was done on both old and new breaks under a microscope.

Bodysherds

During the first season of excavation each bodysherd was counted. This involved a vast quantity of work as there were large numbers of very small sherds which had been broken up by agricultural activities. When the total

Table 4

SURFACE CHARACTERISTICS OF BODYSHERDS

	Unscreened		*Screened*	
	Number	*Percentage*	*Number*	*Percentage*
Cord Wrapped Paddle	500	31.3	1049	36.5
Plain	825	51.7	1273	44.3
Check Stamped	271	17.0	551	19.2
TOTAL:	1596	100.0	2873	100.0

count was something over 40,000 the system was abandoned. It was abandoned not because of the work involved but because the results were largely unproductive. If we continued the count we would have produced a total probably well in excess of a million. This figure would have given the reader a seriously distorted picture of the number of vessels that were used by the people who inhabited the site. In all probability, the number of potsherds reflects more accurately the number of years the site was under cultivation rather than the number of pots which were broken by the inhabitants. A more accurate picture of the quantity of pottery involved is probably derived from weights and volumes. The excavation produced almost 13.5 cubic feet of bodysherds which weighed 1150 pounds and 7679 analyzable rimsherds.

During the 1960 season, a random sample of 1,596 bodysherds was sorted according to surface treatment with the following results: 51.7 per cent were plain; 31.3 per cent had been malleated with a cord-wrapped paddle; the remaining 17 per cent had been malleated or scarified with a paddle which imprinted a check stamp design on the exterior of the vessel (see Table 4).

The following season we repeated the process with another sample of 2,873 sherds selected in the following manner. After the rimsherds had been segregated for cataloguing and analysis, the bodysherds were put through a wire screen with a 1¼-inch mesh. The screened material, that is, the sherds which did not go through the screen, were then sorted according to surface treatment with the following results. This time only 44.3 per cent were plain; 36.5 per cent had been malleated with a cord-wrapped paddle, while 19.2 per cent exhibited a check stamp.

The results obtained from the screened material are probably a more accurate reflection of the ceramic habits of the people under investigation. The difference in results between the screened and unscreened material probably results from the fact that the category "plain" is in our analysis residual. A sufficient number of large plain sherds were found to establish the reality of this category; any bodysherds that were sufficiently small, however, would generally be classified as plain. This results from the fact that with tiny fragments, the sherd itself is smaller than the individual elements on those larger sherds which are classified as cord-wrapped paddle or check stamp.

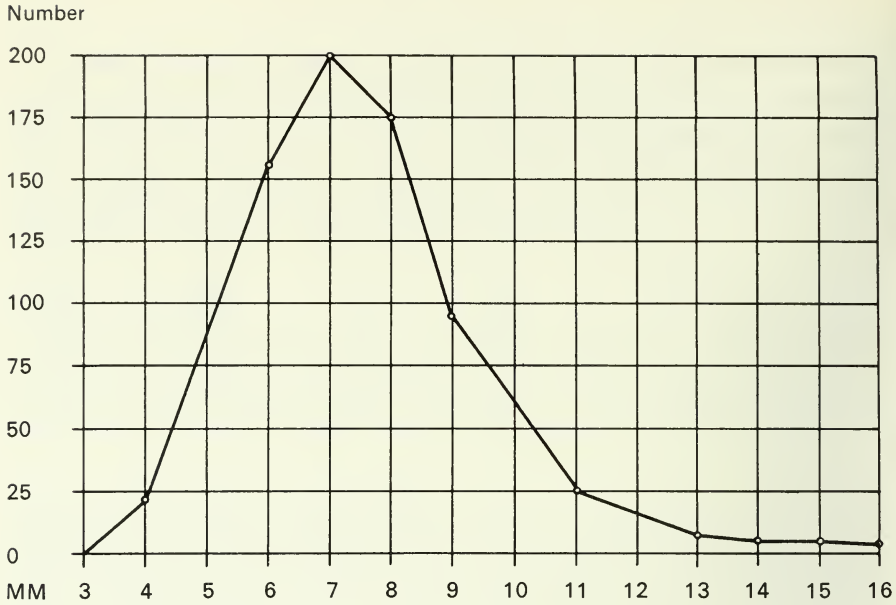

Table 5

BODYSHERD THICKNESS

Sample 1596

In thickness these sherds range from 3–16 mm. with an average of 7 mm. (Table 5). The fact that the curve is skewed to the right probably reflects a functional consideration. With the material and techniques at their disposal it is unlikely that a vessel wall less than 3 mm. in thickness would support the weight of the vessel and its contents. That is, 3 mm. is structurally a lower limit. The upper limit on the other hand is not, within broad limits, structurally defined and therefore the right half of the curve is less steep.

Similar data were recorded on the same sample of potsherds when segregated according to surface treatment. While there was variation between the three curves, they were structurally similar and reflect an ideal thickness of vessel walls of about 7 mm. There is a natural tendency for larger vessels to have thicker walls, and it is highly likely that wall thickness is a simple function of either the oral diameter or the capacity of the vessels.

Rimsherds

Before discussing the sample of rimsherds from the Miller Site, it is perhaps appropriate to introduce some theoretical considerations. How does the archaeologist analyze the artifacts from an excavation? The general procedure is first to segregate the materials into various *groups* on the basis of the materials involved. That is, all lithic materials are placed in one group, all ceramic materials in another; metal, wood, bone, antler, feathers, etc., are treated in a similar manner. Each of these *groups* of artifacts is then divided into *classes* of artifacts, usually on the basis of form, and the related or inferred function. If, for example, we are considering lithic material, this is subdivided into such *classes* of artifacts as projectile-points, drills, knives,

end-scrapers, side-scrapers, etc. It is important to note that in this process, the criteria employed in assigning an artifact to a given class are part of the artifact itself.

Frequently, the analytic process ends with the description of the various classes of artifacts from an excavation. This happens primarily when the purpose of the analysis is to produce a description of the cultural behaviour of a group of people as inferred from their material remains (cf. Rouse, 1953:62).

An additional step is usually taken, however, particularly when the purpose of the analysis is to compare the assemblage under study with other known assemblages to establish its temporal position.

Marian White emphasized this distinction when she said (1961:8):

> Pottery is classified for two general purposes: (1) a description of the pottery-making habits of a group and the resultant products, to allow inferences leading to a description of the culture, and (2) a description of the pottery so that site comparisons may be made to arrange the sites in a specified order.

For the second purpose, the classes of artifacts are usually (or ideally) reduced to "types." Here we may accept the definition of Ritchie and MacNeish (1949:98): a type is "a group of objects exhibiting interrelated similar features which may have temporal and spatial significance." (cf. Krieger, 1944). In his "Iroquois Pottery Types," under methodology, MacNeish defines this further when he states (1952:2):

> We conceive of the typing of archaeological materials as an attempt to recapture the stylistic concepts in the minds of the original makers and to group these concepts in such a way as to show their trends in time and space (cf. Ritchie, 1961:8).

To isolate the "stylistic concepts," both qualitative and quantitative methods may be employed. It might be sufficient merely to note the presence or absence of strap-handles on a collection of vessels, or the separation of painted from unpainted sherds. Quantitative attributes are another matter, for:

> The very nature of quantitative attributes ensures that no two artifacts will yield exactly the same measurements, but it is necessary to discriminate between unimportant and presumably random variation expected of products made by hand from materials which are not uniform and the culturally meaningful variation resulting from significantly differing models held by the makers of the artifacts (Spaulding, 1960:441).

The problem of separating random from meaningful variations can be solved by taking a series of measurements such as oral diameters of vessels and plotting them on a graph. A relatively smooth unimodal curve is generally accepted as an expression of random distribution around an ideal type. A distinctly bimodal curve is accepted as evidence of the presence of two different types with overlapping ranges.

In practice, it is frequently unnecessary to carry out each step in the operation. No one, for example, would resort to measurements to segregate the toy pots from a sample of Iroquois vessels because the distinction between the toy pots and the utilitarian vessels is too obvious. Theoretically,

however, the process is identical, for the purpose is the same — to separate random variations from culturally meaningful variations.

Much confusion has been introduced into the archaeological literature by employing the word *type* in two distinctly different ways. First, we tend to apply this word to every grouping which results from the analysis of a class of artifacts such as projectile-points, pottery vessels, houses, burials, etc. (cf. Krieger, 1944:275). Rouse, for example, employs the word *type* to describe a cluster of individual attributes which he calls "modes." This *type,* as defined by Rouse, is "an abstract kind of artifact which symbolizes the group" (1939:11). This agrees quite well with the position of Spaulding (1960), Krieger (1944) and with part — but only part — of the *type* as having spatial and temporal *significance.* A *type* as defined by Rouse, *et al.,* is a cluster of attributes which defines a class of objects, and which separates this class from all other classes. Each of the attributes is a part of the object under examination. A type as defined by MacNeish is the same thing, plus an evaluation of its significance in space and time. This latter characteristic is not a part of the object under examination, but is of necessity derived from some other body of data.

It was from this theoretical standpoint that the Miller Site rims were approached. It was apparent during the excavation that the pottery could not be fitted into the familiar categories of Ontario pottery; this was equally true of surrounding areas. It was decided, therefore, to analyze the rims in terms of attributes or modes, and through experimentation to see if it were possible to isolate significant attribute clusters or concomitant variations. The resultant clusters would then be *types* in the sense that this concept was employed by Rouse.

To this end, we started our analysis by simple inspection and non-metrical observations. It was immediately apparent that the sample was remarkably uniform as regards a number of attributes. For example, it was noted that the majority of the rims were decorated with a linear dentate stamp. Virtually all of them were reddish-brown to black in colour, and had a flat, square lip. Usually the lip was at right angles to the interior wall of the rim, although a few sloped downward as much as 10 degrees towards the outside of the pot. The overwhelming majority of the rims exhibited a pronounced interior concavity, immediately below the lip. This feature is quite common on early Iroquois sites in Ontario, being referred to usually as a "rolled" rim (Emerson, 1956:3). An additional feature which is characteristic of the sample is a horizontal row of closely spaced interior punctations about one inch below the lip. These raised marked exterior bosses, most of which exhibited the clear whorls and convolutions of a finger- or thumb-print.

Because of the remarkable uniformity of the above attributes, they will be looked upon as a constant. Deviations will be discussed as they occur.

Prior to the formal analysis, the rims were aligned in the drawers of a large cabinet. Each rim was placed in the drawer with the exterior surface upward and the lip of the sherd to the back of the cabinet. During this process, sherds from toy pots were segregated for separate study. Usually, this was a simple process, as these were very small pots which had been modelled

with thumb and finger and, therefore, lacked the fine, smooth finish of the larger, utilitarian vessels. When borderline cases were encountered, they were arbitrarily placed with the toys. During this process, also, any sherds which lacked either the exterior or the interior surface were rejected. At the end of the process, then, we had an analyzable sample of material which had been consistently selected with regard to all features except size. That is, each rim had a lip that was intact, and a portion of both the interior and exterior surface of the vessel. A count at this stage showed that our sample consisted of 7,679 rims.

We attempted next to sort the material according to the various designs found on the exterior surface. This proved to be impossible as there was a marked tendency for the sherds to break along the line of punctations about one inch below the lip. That is, with the majority of sherds, only the area above the line of punctations was available for analysis. From an examination of those rims which included a section of the entire decorated area, however, it was obvious that there was a marked tendency for the line of punctations to separate the upper and lower elements of a design. For example, a very common decorative pattern was a band of linear dentate stamps of which the individual elements sloped downward to the left; below this, a line of bosses completed the exterior decoration. Sometimes, however, there was a second band, sloping to the right, below the bosses; this would result in a chevron pattern, with the two arms of the chevrons separated by bosses. As a result, when a sherd was broken along the line of punctations, as so many of them were, there was no way of assigning it to a category that was established on the basis of designs. That is, a sherd which was decorated with a band of linear dentate stamps of which the individual elements sloped downward to the left, might or might not have been part of a vessel which had been decorated with chevrons. As there was no way of solving this problem, and since both the single sloping line and the chevron occur at the site, the system was abandoned.

Next we sorted the rims according to the technique which had been employed in the decorative process. When there was more than one technique involved, we considered only the dominant technique, that is, the one that occupied the most space on the sherd. If two techniques occupied equal space, we considered only the one which was closest to the lip of the vessel. This method finally produced meaningful results. Six major groups of pottery emerged from the analysis. These groups were reasonably discrete entities and embraced slightly over 97 per cent of the sample.

The dominant technique employed was a linear dentate stamp (Plates 16, 22, 23 and 24). Next in order of frequency was an interrupted linear pattern (Plates 17, 18 and 19) performed with a variety of different tools. Usually the tool was a simple, pointed object with a fairly broad, dull point. This was occasionally bifurcated resulting in a slightly different design, but the technique of application was identical. The next group had been stamped with a suture from a turtle shell. In appearance this group varied considerably because, apparently, a variety of different turtle bones had been employed (Plates 20 and 21). A linear stamp (Plate 27) was employed on slightly over 5 per cent of the sherds. So far as the methods of application

are concerned, the linear stamp, the linear dentate stamp and the turtle suture stamp are identical. The motor habits involved in all three are exactly the same. The difference in appearance in the resulting designs is due entirely to the difference in the tool employed.

The next largest category consists of various punctated sherds. It is generally impossible, with this group, to identify the objects that were used to execute the pattern. This group was also distinct from the four previous categories in that it lacked the formal elements of design characteristic of all the stamped sherds. When working with the pottery, one has the distinct impression that great care was taken to achieve a perfectly regular and uniform pattern on all those vessels which were decorated with any form of linear stamp. The punctated sherds, on the other hand, are very irregular. The small group of plain sherds requires no comment at this stage. A miscellaneous category which embraced 2.46 per cent of the sample was made up of sherds which would not fit any of the other categories. The final group, consisting only of 37 sherds, had been decorated with horizontal, incised lines, usually in conjunction with some other decorative technique. The number and percentage of sherds in each of the above eight categories is listed in Table 6.

Table 6

DISTRIBUTION OF DECORATIVE TECHNIQUES—RIMSHERDS

Technique	*Number*	*Percentage*
Linear Dentate Stamped	5036	65.58
Interrupted Linear	707	9.21
Turtle Suture Stamped	584	7.61
Linear Stamped	417	5.43
Punctated	361	4.70
Plain	348	4.53
Miscellaneous	189	2.46
Horizontal Incised	37	0.48
TOTAL:	7679	100.00

Rim Analysis

PLAIN – 348

The next step in the analysis consisted of subdividing each of the eight classes of rims. The group of "plain" rims was selected for a trial run because of its size. On the one hand, it was small enough to be re-analyzed several times should it prove necessary. On the other, it was large enough to yield statistically reliable results.

First, the distribution of lip thicknesses and oral diameters of this class of vessel was checked for uniformity. When it was found that both distributions were statistically normal, it was assumed that we were dealing with a single, homogeneous class of phenomena. That is, the probability that the sample actually consisted of two ideal sizes of pots — for example, one with

Table 7

ATTRIBUTE DISTRIBUTION—PLAIN RIMS

Exterior	*Interior*	*Lip*	*Secondary Decoration*	*Number*	
P.	P.	P.	None	243	
P.	P.	L.D.S.	None	44	
P.	L.D.S.	L.D.S.	None	30	
P.	P.	P.	None	18	Everted Lips
P.	T.	Punc.	None	6	Everted Lips
P.	P.	Inc.	None	5	Everted Lips
P.	L.D.S.	P.	None	2	
	TOTAL:			348	

Key
P. —Plain
T. —Turtle
L.D.S.—Linear Dentate Stamp
Inc. —Incising
Punc.—Punctated

an oral diameter of 5 inches and another with a diameter of 10 inches — was extremely remote. Next, the sherds were inspected to determine what variable modes or attributes were present that might serve as criteria for sub-classes. Punctations, castellations, lip decoration and interior decoration were all examined and correlated with the following results. When the initial sorting was done on the basis of the shape of the punctation, no concomitant variations were found. That is, there was no observable tendency for vessels that had kidney-shaped punctations to have also lip or interior decoration, for example. Nor did those plain sherds which were castellated vary in any significant way from the balance of the sample. The only significant variation that was found among the rims with undecorated exteriors was the presence of decoration on some of the lips and interiors.

Of the 348 plain rims, 87 or 25 per cent have decoration on the lip, on the interior, or both. The remaining 261 or 75 per cent are completely undecorated. The decorative technique employed on the 87 rims includes incising, linear dentate stamping and turtle suture stamping (see Table 7). Further subdivision of this sub-class of rimsherds revealed that five sherds had obliquely incised lines on the lip only, and that these sherds are all from a single vessel. Another sub-sub-class consisted of six sherds which had small punctations on the lip, and turtle stamps, sloping downward to the left, on the interior. Once again, these six sherds were probably all from a single vessel.

At this point in the analysis, it became apparent that I was no longer examining a class of vessels, but was examining the manner in which a particular potter had interpreted an "ideal type" or customary pattern. It was assumed, initially, that those vessels which lacked exterior decoration formed a particular class of vessels, that the potters thought of vessels with plain exteriors as a particular kind of vessel. There may or may not have been functional differences between the classes of vessels at the Miller Site: the

"thought" processes of the potter may or may not have been conscious. But his behaviour in the manufacture of pottery was certainly dominated by culturally defined values, by ideas as to the traditional or "correct" way in which a vessel "should" be made. Degrees of skill in the conception and execution of a traditional form would vary between potters. Small differences in the physical and chemical properties of the clay and tempering materials would also appear. The combination or sum of these variations would produce a more or less wide range of vessels within any one category. The potter, and presumably any other member of the group who lived at the Miller Site, could probably assign any given vessel to its appropriate category. He could do this because his knowledge of the traditional ways of making pottery vessels would enable him to ignore any idiosyncratic features. He could see behind these features the particular combination of attributes that defined a ceramic tradition. The archaeologist, on the other hand, until he has isolated that tradition by tracing it through time and space (i.e., until he has established pottery types) frequently has no way of determining which modes or attributes are a formal part of the tradition, and which are idiosyncratic. The essential problem with the Miller Site ceramic sample is to isolate any classes of vessels which might be representative of one or more traditional patterns. To achieve this end, it is essential that the study be confined to group or class characteristics. We do not yet know the limits of these classes, but it is evident that we have exceeded these limits in the analysis of the rims with plain exteriors. We have moved from the consideration of a class of vessels to the manner in which an individual potter has interpreted the cluster of essential modes or attributes which define that class.

To test the validity of this conclusion, the same method of analysis was applied to another of our eight classes of vessels. For the purpose, those vessels with an interrupted linear pattern on the exterior were chosen.

INTERRUPTED LINEAR – 707

This class of rims consists of 707 specimens decorated with from two to nine horizontal rows of interrupted linear designs on the exterior surface (Plates 17, 18 and 19). Most of these rims (78.2 per cent) have a linear dentate stamp design on the lip and on the interior. The individual lines composing these patterns slope downward to the left on both the lip and the interior.

The remaining 154 rims (21.8 per cent) differed from the majority of vessels in the following manner (see Table 8). Seventy-five lack the interior decorations, twenty-nine have punctations on the lip, replacing the more common linear dentate stamp, seventeen specimens have undecorated lips; seven sherds lack both interior and lip decoration; four sherds, from a single vessel, have a double line of shallow punctations as interior decoration; one has incising on the lip. As with the linear dentate stamp usually found there, the individual incised lines slope downward to the left. Finally, 21 sherds have secondary decoration. On six of these, the secondary decoration is applied by incising. One of the six differs from the others in having a plain interior. The remaining 15 which have secondary decoration have a band of linear dentate stamping below the interrupted linear design.

Table 8

ATTRIBUTE DISTRIBUTION—INTERRUPTED LINEAR RIMS

Exterior	*Interior*	*Lip*	*Secondary Decoration*	*Number*
I.L.	L.D.S.	L.D.S.	None	553
I.L.	P.	L.D.S.	None	75
I.L.	L.D.S.	Punc.	None	29
I.L.	L.D.S.	P.	None	17
I.L.	P.	P.	None	7
I.L.	Punc.	L.D.S.	None	4
I.L.	L.D.S.	Inc.	None	1
I.L.	L.D.S.	L.D.S.	Inc.	5
I.L.	P.	L.D.S.	Inc.	1
I.L.	L.D.S.	L.D.S.	L.D.S.	15
	TOTAL:			707

Key
I.L. —Interrupted Linear
L.D.S.—Linear Dentate Stamp
P. —Plain
Inc. —Incising
Punc.—Punctation

The final categories resulting from the analysis of those sherds decorated with an interrupted linear design on the exterior surface raise the same problem that resulted from the analysis of the plain rims. At least some of the final categories, and possibly all of them, are simply individual variations about a traditional form.

TURTLE SUTURE STAMPED – 584

This class of vessel (Plates 20 and 21), represented in the sample by 584 analyzable rims, was decorated by impressing the suture of a turtle shell — probably a plastron — into the wet clay. As a rule, these rims have from one to five bands of this stamping, with the individual impression sloping downward to the right. Where there is more than one band of decoration, the resulting pattern is frequently a chevron or herring bone. As with the previous classes of rim, a number here deviate from the normal in that they lack interior decoration, lip decoration or both, or that they exhibit an additional form of decoration (Table 9). Almost 68 per cent of the sample is normal; slightly over 32 per cent are deviates. Again, the major form of deviation is the absence of lip or interior decoration — 12.84 per cent.

A peculiarity of this group as compared with the group of sherds decorated with a linear dentate stamp is the angle of slope of the individual stamp marks (see Table 11). If we examine the total group of rimsherds which were decorated with either a turtle suture or a linear dentate stamp we find that 5349 are sloped quite definitely to either the right or left if the analysis is confined to the uppermost decorative element. We find, further, that if the design on the exterior surface slopes downward to the right, both the lip and

interior designs also slope downward to the right. This is true of almost 68 per cent of the "turtle" rims.

Table 9

ATTRIBUTE DISTRIBUTION—TURTLE RIMS

Exterior	*Interior*	*Lip*	*Secondary Decoration*	*Number*	
T.	T.	T.	None	492	
T.	P.	T.	None	52	
T.	U.	U.	None	20	
T.	T.	T.	Inc. & Zoned L.D.S.	5	
T.	P.	P.	None	4	
T.	L.D.S.	T.	None	4	
T.	T.	P.	None	3	
T.	P.	T.	O.H.	2	
T.	T.	Inc.	None	1	
T.	T.	T.	None	1	Everted Lip
	TOTAL:			584	

Key
T. —Turtle
L.D.S.—Linear Dentate Stamp
U. —Undecipherable
O.H.—Ontario Horizontal
Inc. —Incising
P. —Punctated

LINEAR DENTATE STAMPED – 5036

Apart from being much more popular than any other kind at the Miller Site, the linear dentate stamped rims (Plates 22, 23 and 24) show approximately the same distribution of characteristics as the previous class. That is, if the uppermost line of exterior decoration sloped to the left, the majority of lips and interiors were also decorated with a linear dentate stamp which sloped downward to the left. This, together with an absence of secondary decoration, was found to characterize over 80 per cent of the rims.

Again, a large number of those rims which deviated from the norm were distinguished only by the absence of interior or lip decoration or both (Table 10). A marked difference was noted, however, in the slope of the individual design elements. While almost 68 per cent of the designs on the "turtle" rims sloped downward to the right, over 93 per cent of the designs on the linear dentate stamped rims sloped downward to the left (Table 11).

The distribution of secondary decoration on this class of vessel, as well as on the other classes, cannot be described statistically because most of the sherds are small, and secondary decoration on the vessels represented by our sherd sample was probably well under 10 per cent. Plates 18, 19 and 21 illustrate a variety of sherds of different classes which exhibit secondary decoration.

Table 10

ATTRIBUTE DISTRIBUTION—LINEAR DENTATE STAMPED RIMS

Exterior	*Interior*	*Lip*	*Secondary Decoration*	*Number*
L.D.S.	L.D.S.	L.D.S.	—	4101
L.D.S.	P.	L.D.S.	—	439
L.D.S.	P.	P.	—	287
L.D.S.	L.D.S.	P.	—	134
L.D.S.	L.D.S.	L.D.S.	Inc.	41
L.D.S.	P.	L.D.S.	Inc.	28
L.D.S.	L.D.S.	P.	I.L.	6
	TOTAL:			5036

Key
L.D.S.—Linear Dentate Stamp
P. —Plain
I.L.—Interrupted Linear
Inc.—Incising

LINEAR STAMPED – 417

The designs executed with a linear stamp are identical to the linear dentate stamped specimens. That is, there are one or more bands of closely spaced lines sloping downward to both right and left, as well as chevron and herringbone patterns. If the individual lines which form the uppermost band of exterior decoration slope downward to the left, in the majority of specimens both the lip and interior decoration are executed with the same tool held at the same angle. If the exterior decoration slopes to the right, lip and interior decoration (if present) also slope to the right. On the 417 linear stamped rims, 361 or 86.57 per cent sloped to the left (Table 11) while only 56 or

Table 11

ANGULAR DISTRIBUTION[1]

Type	*Right*		*Left*	
	Number	*Percentage*	*Number*	*Percentage*
Turtle Suture Stamped	395	67.64	189	32.36
Linear Dentate Stamped	333	6.99	4432	93.01
Linear Stamped	56	13.43	361	86.59
TOTALS:	784	13.59	4982	86.41

[1] The vessels on which the design elements slope downward to the left were probably produced by right-handed persons. In the population then, other things being equal, 86.41 per cent were right-handed, and 13.59 per cent were left-handed. Although these figures agree fairly well with comparative data from our own culture (Enstrom, 1962), it should be noted that data on the present North American population are not conclusive.

No explanation can be found for the high correlation between left-handedness and turtle-suture stamping.

Table 12

ATTRIBUTE DISTRIBUTION—LINEAR STAMPED RIMS

Exterior	*Interior*	*Lip*	*Secondary Decoration*	*Number*
L.S.	L.S.	L.S.	None	239
L.S.	P.	L.S.	None	150
L.S.	L.S.	L.S.	Inc.	14
L.S.	P.	L.S.	Inc.	7
L.S.	L.S.	L.S.	I.L.	6
	TOTAL:			417

Key
L.S.—Linear Stamp
P. —Plain
Inc.—Incising
I.L.—Interrupted Linear

13.43 per cent sloped to the right. These figures are so similar to corresponding figures for the linear dentate stamped group that they might be considered a single class of vessels.

Among the sample of 417 rims, 261 or 62.59 per cent are normal in that the same decoration appears on the exterior, interior and lip; 156 or 37.41 per cent deviate from this norm (Table 12). The majority of the deviant rims in this group, as in the previous groups, differ only in that decoration is absent from the interior, the lip, or both.

The five classes of pottery already discussed — plain, interrupted linear, turtle suture stamped, linear dentate stamped and linear stamped — embrace 92.36 per cent of the total sample of rimsherds, and contain the finest pottery from the site. The potters who manufactured these vessels took great pride in their work. Surfaces on almost every sherd are carefully smoothed, lip thickness is remarkably uniform, and the angle between the lip and the interior and exterior surfaces is sharply defined. Decoration was applied with precision and certainty, as though the potters were thoroughly familiar with both the techniques and designs.

These stand in marked contrast with the remaining 587 sherds which constitute only 7.64 per cent of the sample. Although they have been placed in three different categories, the distinction between the "punctated" and "miscellaneous" groups is not as absolute as the figures in Table 6 suggest. Those sherds classed as "horizontal incised" on the other hand seem sufficiently discrete to justify a separate category. As a group, these three classes tend to lack the fine modelling of the previous five classes. Nor is the decoration so carefully applied as a rule.

At this point, it might be profitable to recapitulate briefly. In analyzing the rimsherds from this site, I have found the typological concepts of Ritchie and MacNeish (1949) largely irrelevant because of a lack of comparative data. What has been done, therefore, is to determine and plot the distribution of specific "modes" or "attributes" of the pottery without attempting to group these characteristics in any formal manner. The categories arrived at could

be called "types" if we use that concept as it was employed by Rouse (1939: 11). At present, however, I see no advantage in doing so. In their present form, the data are available for the establishment of "types" whenever the necessary comparative data are at hand.

Reconstructed Vessels – 6

Six of the Miller Site vessels are represented by sufficiently large fragments that their individual description seems warranted.

Vessel No. 1 (Plate 25) is 10 inches high with an outside oral diameter of 8 inches. The somewhat globular vessel was beaten with a checked stamp which left small rectangular impressions measuring 2 mm. by 3 mm. on the body and neck of the pot. Below the neck, this same instrument was dragged across the wet clay, creating a ribbed paddle effect. Decoration was applied by a small dentate stamp measuring 8 mm. in length and approximately 2 mm. in width. Three bands of decoration were applied to the exterior surface of the rim of the vessel, creating the herring-bone pattern which is evident in the photograph. Lip decoration consists of a single longitudinal line of closely spaced punctations. The interior of the rim, which exhibits a single castellation, is not decorated.

Vessel No. 2 (Plate 26) is very similar to the previous specimen in its general characteristics. Although it is much smaller, having an oral diameter of only 5 inches, it too is decorated with three bands of linear dentate stamping which form a herring-bone pattern on the exterior of the rim. Below this, on the neck of the vessel, is a band of 14 interlocking incised triangles, some 35 mm. high. Both the lip and interior are decorated with a linear dentate stamp; the body of the vessel was again malleated with a check stamp. This specimen, too, exhibits a single castellation, as do the majority of the vessels from the site. Like the previous specimen, this vessel is very unusual in that it lacks interior punctations.

Vessel No. 3 (Plate 27) is 5 inches in diameter, and is decorated with two bands of linear stamping on the exterior. Below this, the exterior bosses are separated by paired punctations, except under the single castellation where they are separated by single punctations. The neck of the vessel is encircled by a band of eight incised lines which are crossed at intervals by groups of four or five diagonally incised lines. The body of the vessel was probably ribbed with the vertical impressions left by a cord-wrapped paddle. Subsequent smoothing, however, has obliterated most of the pattern. Both the lip and interior are also decorated with a linear stamp.

Vessel No. 4 (Plate 17) has an outside oral diameter of only 4.5 inches. Both the interior and lip are decorated with a linear stamp. A thin band of the same stamped impression occupies the upper 5 mm. of the exterior surface. Below this are two horizontal bands of interrupted linear designs. The upper band is above the bosses, and consists of four lines; the band below the bosses consists of five lines. It is probably worth noting that the interrupted linear design was applied after the bosses had been raised, for in several places the linear pattern is clearly visible on the shoulder of the boss, with no evidence of smudging. This is in marked contrast with the linear dentate stamped vessels, where the bosses were raised after the exterior design was applied.

The body of this vessel bears the vertical impressions of a cord-wrapped paddle.

Two castellations are present on the reconstructed portion of the pot. Their spacing is such that the entire vessel (if it were symmetrical) would have exhibited four evenly spaced castellations.

Vessel No. 5 (Plate 20), with an oral diameter of some 6.5 inches, also has vertical cord-wrapped paddle impressions on the body of the pot. Decoration on the interior, lip and exterior consists of bands of turtle suture stamping. That on the exterior is composed of three bands forming a herring-bone pattern. With this specimen, as with the majority of "turtle" rims, the bosses were raised after the exterior decoration was applied. A single castellation is present.

Vessel No. 6 (Plate 28) varies from the normal pattern in that the orifice was probably oval rather than round. A linear dentate stamp design appears on the exterior and interior of the rim; the lip is undecorated. The body of the vessel was malleated in a rather irregular manner with a checked stamp. The single castellation present on the fragment is the largest, most elaborate specimen found at the site.

Size of Vessels

The size and shape of Miller Site vessels could not be determined to the point where generalization can be made. A reasonably adequate sample of orifices was obtained through reconstruction of rim and neck sections, but in only one instance were we able to continue the reconstruction to include the base. This vessel (Plate 27) is 10 inches high and has an outside oral diameter of 8 inches. That is, with this particular specimen, the height is 1.25 $\times$ the oral diameter.

Oral diameters were obtained by comparing each large rim fragment with a series of concentric circles which were drawn on a thin sheet of plywood.

Table 13

DISTRIBUTION OF ORAL DIAMETERS OF VESSELS (IN INCHES)

Type	*Linear Dentated Stamped*	*Plain*	*Linear Stamped*	*Interrupted Linear*	*Miscellaneous*	*Punctated*	*Turtle Suture Stamped*	*Total*
Range	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
3–4	7	3	1	3	5	1	1	21
5–6	34	7	4	8	7	2	3	65
7–8	27	8	9	14	7	5	18	88
9–10	37	3	4	4	—	4	19	71
11–12	23	4	6	4	—	2	16	55
13–14	24	1	1	—	1	—	16	43
15–16	5	1	1	—	—	—	9	16
17–18	1	1	—	—	1	—	3	6
19–20	1	—	—	—	—	—	—	1
TOTAL:	159	28	26	33	21	14	85	366

Through experiments with those restored specimens which had over one-third of the orifice present, it was found that our results were probably reliable within an error of ± 1 inch. That is, the actual oral diameter of a vessel which is listed as having an oral diameter of seven inches, is probably between six inches and eight inches. It was also found that only a fairly large segment of the rim could be measured to even this degree of accuracy.

Out of our total sample of 7679 rimsherds, only 366 were sufficiently large and uniform to be measured for oral diameter. These specimens ranged from 3 inches to 20 inches, with an average diameter of 9.66 inches. Table 13 shows the distribution of oral diameter measurements grouped according to type of vessel.

Toy Pots

Only one complete toy pot was excavated at the Miller Site (Plate 22, No. 7). This was a grit-tempered vessel, 4.8 cm. high, with an oral diameter of 4.6 cm., and a maximum body diameter of 4.5 cm. Walls were approximately 7.0 mm. thick. Decoration, confined to the upper half of the vessel, consists of two different elements. Around the top of the vessel is a band of linear dentate stamp impressions, about 1.0 cm. high. The individual lines of stamping are mainly vertical, but one segment slopes downward to the left. Below this band are two horizontal lines of linear dentate stamping.

Two other toy pots from the site are almost complete. Both are undecorated. The first (Plate 22, No. 8) is a shell-tempered specimen 5.2 cm. high, with an oral diameter of 3.6 cm. and a maximum body diameter of 4.7 cm.; the second specimen (Plate 22, No. 6) is a minute, grit-tempered vessel only 2.7 cm. high. It has an oral diameter of approximately 2.5 cm. and a maximum body diameter of 2.0 cm.

Workmanship on this specimen is extremely crude, as it is on the entire group of toy vessels (Plate 29, Nos. 1-8). Not only is the decoration applied in a most irregular manner, but the vessels themselves are very poorly formed. On most of them, the body was crudely pressed into shape, with little effort spent on smoothing even the outer surface. This is in sharp contrast with the utilitarian vessels from the site.

In addition to the three vessels described above, the excavation produced 247 sherds which could, with reasonable certainty, be classified as fragments of toy pots. Of these, only 28 are bodysherds, while the remaining 219 are rims. This very unusual ratio of rims to bodysherds results from the fact that small body fragments from the small and crude toy pots are extremely difficult to identify. Most of the bodysherds from this class of vessels, therefore, were not segregated from the larger mass of bodysherds of all kinds which the site produced.

It is probably significant that every variety of decoration that was found on the utilitarian vessels from the site was also found on the toy vessels. That is, the toy pots cannot be assigned to some functional category (ceremonial or funerary, for example) which differs from that of the larger vessels. Because the only criteria on which the two classes of vessels could be separated were size and quality of workmanship, it is probably safe to assume that the

Table 14

VARIETIES OF RIMSHERDS FROM TOY POTS

	Class	*Number*	*Percentage*
1	Plain	79	36.1
2	Stamped and/or Punctated	78	35.6
3	Incised	39	17.8
4	Combination of 2 and 3	23	10.5
	TOTAL:	219	100.0

toy pots were made by young girls who were practising the skills they would need as adults.

Of the 219 rims from toy vessels, the largest category, slightly over 36 per cent, is undecorated (Table 14). The next largest category is characterized by a variety of designs executed with stamps and punctations. Because of the inadequate size of the sample, as well as the irregularity of the workmanship, no attempt was made to subdivide this category. Next in order of frequency is a group of 39 rimsherds which is decorated only by incising; finally, a total of 23 rims was decorated by a combination of the techniques employed in the second and third classes. That is, incising was combined on these vessels with either stamping or punctating or both. Table 14 presents these data in tabular form.

Pipes

Only five complete pipes were found during the excavation of the Miller Site (Plate 30, Nos. 1, 3–6). These, with the exception of No. 5, are small, obtuse angle elbow pipes, ranging in overall length from 5.2 cm. (No. 1) to 6.8 cm. (No. 3). Flattening of the upper surface of the stems is present in all five specimens, being most marked in No. 1. Although it is not apparent on the photograph, there are various degrees of flattening on the "stem" side of the bowl, also on Nos. 1, 3 and 4. Again, this is most marked on No. 1.

Decoration is present on three specimens only. No. 4 exhibits an incised, curvilinear pattern, one of only two examples of curvilinear design encountered at the site. No. 6 is decorated by a single incised line encircling the bowl immediately below the rim. The most ornate specimen is No. 5. Extending about halfway down the bulbous bowl is a very fine herring-bone pattern; below this, and covering the stem, is an irregular pattern of punctations.

No. 2 is included only because of its very small size. Although both the tip of the stem and the rim of the bowl are missing, it conforms to the general shape and characteristics of the complete specimens. In all probability, then, it is relatively complete; yet its maximum dimension is only 3.2 cm.

Apart from the six relatively complete pipes illustrated on Plate 30, the excavation produced a total of 412 pipe fragments.

Twenty-one of these were steatite; the remaining 391 were ceramic. The

steatite fragments are too small to warrant any detailed consideration, except for one specimen. This, the larger part of a bowl, is oval in cross-section with a major diameter of 2.6 cm., and a minor diameter of 1.8 cm. The orifice is 1.2 cm. in diameter and 5.2 cm. deep. Decoration is limited to a single, shallow, horizontal groove which bisects the low, narrow collar.

A small portion of the stem-hole is preserved at the bottom of the bowl. From its position and angle, we can be almost certain that the specimen was an obtuse angle elbow-pipe, probably similar in angle to those illustrated on Plate 30. The stem was perpendicular to the major axis of the oval bowl.

The 391 ceramic pipe fragments appear to have been fashioned from the same clay that was used for the vessels from the site. Tempering, however, is largely absent. Those pipe fragments which are tempered have the tempering material present in such small quantities that its inclusion is probably accidental.

Of the 391 ceramic pipe fragments, 210 are essentially bowls, and 181 are essentially stems. Although the stem fragments exhibit some variation, the most common form, as seen in section, is circular to oval, with a flattened upper surface (Plate 31). Next in order of frequency is the diamond-shaped sectional form illustrated on Plate 31, No. 3. Only one small stem fragment exhibits a section that might be described as circular, and this one is too irregular to be classified with any certainty. Most of the pipe stems are undecorated. Only 15 fragments have crudely formed designs which were executed by incising and punctation, either singly or in combination.

Of the 210 bowl fragments, 116 are rims; the remaining 94 are from the body of the pipe bowl. Generally, the pipe bowls were cylindrical, and over one-half of them were undecorated. Slightly over one-third of the sample had a small collar ranging in height from 4 mm. to 11 mm. On examination, the rim fragments from pipe bowls fell neatly into five classes: Class I consists of undecorated and uncollared sherds (Plate 32, Nos. 2 and 5); Class II are collared rims which have either one or two horizontally incised lines encircling the bowl on the collar (Plate 32, Nos. 7 and 8); Class III are collared sherds which are undecorated (Plate 32, Nos. 4 and 6); Class IV consists of 16 sherds which were crudely decorated by punctations and incision (Plate 32, Nos. 9-14); Class V comprises those rims which are uncollared, but are decorated with either one or two horizontally incised lines (Plate 32, No. 1).

Table 15

RIMSHERDS FROM CERAMIC PIPES

Class	*Number*	*Characteristics*	*Percentage*
I	51	Undecorated and Uncollared	43.9
II	20	Horizontally Incised and Collared	17.2
III	16	Undecorated, Collared	13.8
IV	16	Miscellaneous	13.8
V	13	Horizontally Incised, Uncollared	11.3
TOTAL:	116		100.0

V *Conclusions*

AN INTRODUCTION TO THE "PICKERING CULTURE"

Ceramic material similar to that from the Miller Site was first reported stratigraphically in Ontario by W. A. Ritchie (1949:10). He found this material in the sod and loam stratum of his excavation on East Sugar Island in Rice Lake, and described it with the following comments:

> This group of sherds is unequivocably related to the pottery of the Uren village site, situated approximately 160 miles west in Oxford County on the Ontario Peninsula and regarded as proto-Neutral by Wintemberg.

At the Frank Bay site on Lake Nipissing, Frank Ridley (1954:44) found the same material stratigraphically located between an underlying Point Peninsula stratum and an overlying Iroquoian stratum. Its temporal position then, in terms of relative rather than absolute chronology, would be between Point Peninsula and Iroquois times. Ridley has suggested (1958: 34) that this material is contemporaneous with the Owasco of New York State. Miller-like pottery, then, should date between A.D. 905 and A.D. 1435, the earliest and latest Owasco dates (Ritchie, 1961:29).

The single C-14 date from the Miller Site was based on a charcoal sample from the pit in Area O. Removed from a lens of refuse at a depth of 20 inches from the surface, the sample was covered by a thin unbroken stratum of clean sand. Above this stratum, and continuing to the surface, was an undifferentiated stratum of refuse material. The sample, analyzed by Prof. K. J. McCallum, University of Saskatchewan, yielded a date of 835 ± 70 B.P., or 1125 A.D. (McCallum and Wittenberg).

In an attempt to determine the spatial distribution of Miller-like pottery, I examined the collections and records at the Royal Ontario Museum with the following results.* The limits of distribution, so far as is known, are from Oxford County to Belleville, to the south-west corner of Algonquin Park, to Sault Ste. Marie and to Owen Sound. Most of the sites, however, are east of Toronto, in the Bowmanville-Port Hope area. The only reported site of this type in New York State is the Pillar Point site in Jefferson County.

Although Miller-like pottery has been called Glen Meyer (Ridley, 1958 and Lee, 1958), I question the validity of this attribution. In the absence of detailed descriptions of Glen Meyer material (Lee, 1952), it is impossible to document this statement. The small sample of Glen Meyer material that I have examined, however, is certainly unlike the material from the Miller Site. Dr. J. V. Wright, of the National Museum of Canada, who is currently studying the Glen Meyer materials, and who has examined the Miller Site ceramics in some detail, has also suggested that the differences are sufficiently marked to warrant their separation.

*All of the material referred to here was surface collected, and is therefore of limited value. In the absence of more rigorously controlled material, however, it will perhaps shed some light on the subject.

Until the Glen Meyer materials are published, making detailed comparison possible, there is no way of determining the relationship between these two groups. For the present, therefore, I will refer to the Miller Site as a component of the *Pickering Culture*. Until further work either modifies or augments the present picture, we may define the Pickering culture in terms of the characteristics which constitute the body of this report.

The origins of the Pickering Culture are not known in detail. The dentate stamping tradition, so strong at the Miller Site, is probably derived from the same strong tradition in Ontario's Point Peninsula. At present, however, there is a gap of almost a thousand years between the most recent Point Peninsula date in Ontario — A.D. 128 (Johnston, 1959:10) — and the Miller Site at A.D. 1125. Because of the size of this hiatus, any detailed comparisons would be meaningless.

Nor would it be profitable to compare the Pickering Culture pottery with those Hopewellian types which are also characterized by external nodes and linear dentate stamping — e.g., Naples Stamped (Griffin, 1952; Plate XXXII, p. 109). Here we not only have a similar temporal hiatus (Griffin 1958: figs. 1 and 2), but a spatial separation as well.

Until much more work has been done, we are forced to leave any detailed questions regarding the origins of the Pickering Culture in abeyance. At present we are totally unable to explain the persistence of dentate stamping, particularly in such quantities as were found at the Miller Site, to such a recent date.

In my opinion, the Pickering Culture will ultimately prove to be a lineal descendant of the Point Peninsula culture. Admittedly, there are no concrete data in support of this position, but at present it raises fewer obstacles than any alternative hypothesis.

A comparison of the Miller Site with the contemporaneous Owasco of eastern New York State reveals some similarities, but by and large tends to emphasize their differences. The "rolled rim," for example, that is characteristic of the Miller Site pottery is also present in the late Owasco sites. That this attribute of Owasco pottery is increasing in popularity can be seen by comparing its frequency at the Sackett site, where it first appears, with the late Owasco Bainbridge site. The increase is from .07 per cent to 66 per cent (Ritchie and MacNeish, 1949). This, together with several features of design, and overall vessel shape, would suggest a high degree of similarity between the two cultures.

On the other hand, the Owasco series is characterized by a paramount emphasis on cording as a decorative technique, an attribute which does not appear at the Miller Site. Of the 17 Owasco pottery types listed by Ritchie and MacNeish (1949) cording is characteristic of nine types, and is usually present in the remaining seven, although it may be replaced by other decorative techniques in the latter groups.

The Owasco series, then, "is characterized by corded stick ornamentation" (Ritchie and MacNeish, 1949:107) on outsloping rims — 13 out of 16 types — and the presence of dentate stamping only as a trace element (p. 120). The Miller Site pottery is characterized by linear dentate stamping (65.58 per cent) on a "rolled rim;" cording is absent.

Projectile points from both the Miller Site and the Owasco of New York State are rather variable, with the triangular form being present in both cultures (cf. Plate 8 with Ritchie, 1944, Plates 26 and 38). The New York specimens, however, are relatively broader in relation to their length, and are characterized by a very high incidence of basal concavity. Although Ridley found only two complete points at the Boys site (1958:20 and Plate 5, fig. 20) it is perhaps significant that these were identical with the Miller material rather than the Owascoid.

Pipes from the Miller Site, insofar as one can determine from the numerous fragments and the five complete specimens, are largely of the obtuse elbow form (Plate 30). Similar forms occur throughout the Owasco series (Ritchie, 1944, Plates 7, 24 and 34), as well as at the Boys Site (Ridley, 1958, Plate 5).

There are inherent problems in comparing the Pickering culture with the contemporaneous Owasco culture of eastern New York State so long as we have a relatively broad picture of the former culture only from the Miller Site. At present, we cannot be certain that the Miller Site is, in fact, a representative example of that culture. Only future excavations can solve this problem. Present indications are, however, that those features of similarity noted above can best be explained by a common ancestry. That is, both the Owasco and the Pickering cultures are derived essentially from a common, Middle Woodland (Point Peninsula) ancestor. The differences already noted would then be due to emphasizing different features of the common, ancestral culture. The potters of the Pickering group, for example, chose to select and elaborate the dentate stamping tradition which was an increasingly popular feature of the Point Peninsula series (Ritchie and MacNeish, 1949: fig. 42), while the Owasco potters preferred and developed the corded decoration which was also increasing in popularity throughout Point Peninsula times.

Triangular points, and probably the entire lithic complex of both Pickering and Owasco as well, can derive also from the Point Peninsula (Ritchie, 1944:116, and Wright, 1963: Plate XX, fig. 8). And again, the relatively greater width of the Owascoid triangular points, as well as their basal concavity, probably derived from differential selection of features. Although pipe-forms in both the Owasco and Pickering cultures are derived from the Point Peninsula culture (Ritchie, 1944: Plate 64), many of the Owasco pipes are modified in that the angle between the bowl and the stem becomes more acute, and there is a tendency to develop a spur at the base of the bowl. The Miller Site pipe-form has undergone less modification (Plate 8 with the exception of No. 6). With both the Pickering and Owasco pipes, there is a tendency to increased decoration on both bowls and stems.

Although I have suggested here that Owasco and Pickering are modified descendants of a common culture insofar as the previous discussion is concerned, I do not wish to suggest that they developed in complete isolation. The details regarding their relationship, as contemporaries, can only be traced, however, when we have defined the Pickering culture more precisely in both space and time, and when the Glen Meyer of Peninsula Ontario has been more thoroughly examined and reported.

Significant differences between the Owasco and the Pickering cultures are found in burial practices and house forms. Owasco burial practices were summarized by Ritchie (1944:50) as follows:

> Burial practices were simple, the large majority of skeletons found being simple inhumations in the loosely or tightly flexed positions. However, multiple flexed, multiple bundle, semi-sitting, sitting, extended (young infants only), and a single skull burial containing finger bones are on record.

More recently, Guthe stated (1960:212): "Ossuaries . . . are not part of the Owasco complex." While the sample of graves from the Miller Site is statistically inadequate, such data as are available point unmistakably to the practice of multiple secondary burials or small ossuaries.

House-forms at the Miller Site are flattened ovals ranging from 45.0 feet to 60.3 feet in length and from 20.6 feet to 27.0 feet in width. Although house forms have not been traced through all of the intervening stages, there can be little doubt that the Miller houses are ancestral to the Long House of the later Iroquois periods. Early Iroquois house-types, to the best of my knowledge, are not known. At the Getman site, however, Ritchie found (1961:34) that the Mohawk were occupying palisaded villages of long-houses up to 90 feet in length around A.D. 1400. One hundred years earlier, an Owasco settlement, the Bates site in south-central New York, may have had either round or oval houses. At present, the data are a bit ambiguous (Ritchie, 1961:35); we do know, however, that circular houses about 10 feet in diameter were present in early Owasco times (Ritchie, 1936:39-43, and 1944:52).

Ritchie has suggested that the long house may have developed through an expansion of an oval house-form (1961:35). While present evidence suggests that the early Owasco peoples lived in circular, single-family dwellings by about A.D. 1300, there is a possibility that the inhabitants of the Bates site were already living in multi-family oval structures. In any event, the presence of the "long-houses" at the Miller Site about A.D. 1125 makes it no longer necessary to look outside of Iroquoia for the origin of this central feature of Iroquois culture. That the Miller Site houses are no isolated phenomena is shown by the presence of similar structures at the Bennett site, near Burlington, Ontario. Excavated by J. V. Wright of Canada's National Museum, and considered by him to be the final stage of the Pickering culture, the village was occupied in the second half of the 13th century A.D. (personal communication).

The problem of the origin of the Western Iroquois is by no means solved. However, there can be little doubt that the Pickering culture, as defined in this paper, confirms the hypothesis of MacNeish, and can be accepted as the postulated "Ontario Owasco." Technically, it is not Owasco but a parallel development that, in all probability, grew out of a common Middle Woodland (Point Peninsula) culture. Present evidence would suggest that the Owasco and Pickering cultures developed in relative isolation.

Wright (N.D.) believes that the Glen Meyer culture also developed, contemporaneously, in relative isolation. From about A.D. 900 to A.D. 1300, then, Owasco culture was developing in New York State, east of the Genes-

see River; Pickering culture was developing in south-eastern Ontario; and Glen Meyer culture was developing in south-western Ontario. At, or near, the end of this period, the Pickering and Glen Meyer cultures merged to form the Uren stage of early Iroquois (Wright, N.D.).

Ritchie has suggested (1961:36) that the pan-Iroquoian culture of late prehistoric times developed as the distinctions between the eastern and western centres of development were blurred by interaction. The eastern centre was based essentially on the earlier Owasco culture which did not spread west of the Genessee River. The western centre was based on the Pickering culture, with a strong but as yet undefined infusion from the Glen Meyer.

In summary, the excavation of the Miller Site has produced a large body of data which not only supports the *in situ* theory of MacNeish, but also demonstrates the essential soundness of the methodology (MacNeish, 1952) that was employed in the formation of that theory.

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Plate 1 *Burial No. 2*

Plate 2 *Burial No. 3*

Plate 3 *Burial No. 4*

Plate 4 *Burial No. 5*

Plate 5 *Half (?) of gneiss disc*
Scale: 1¼ natural size

Plate 6 *Scale: 1¼ natural size*

1. *Schist adze blade*
   Cat. No. MU. 44
2. *Schist adze blade*
   Cat. No. MC. 352
3. *Schist adze blade*
   Cat. No. MB. 271
4. *Schist adze blade*
   Cat. No. MT. 4
5. *Schist adze blade*
   Cat. No. MQ. 231

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Plate 7 *Scale: 1¼ natural size*

1. *Flint end-scraper*
   Cat. No. MQ. 472
2. *Flint end-scraper*
   Cat. No. MP. 436
3. *Flint end-scraper*
   Cat. No. MQ. 797
4. *Flint end-scraper*
   Cat. No. MH2. 48
5. *Flint end-scraper*
   Cat. No. MH. 68
6. *Flint end-scraper*
   Cat. No. MI. 196
7. *Flint end-scraper*
   Cat. No. MQ. 226
8. *Flint end-scraper*
   Cat. No. MP. 827
9. *Flint end-scraper*
   Cat. No. MQ. 713
10. *Flint side-scraper*
    Cat. No. MK. 86
11. *Flint side-scraper*
    Cat. No. MQ. 621
12. *Flint side-scraper*
    Cat. No. MO. 187
13. *Flint side-scraper*
    Cat. No. ME. 26
14. *Flint side-scraper*
    Cat. No. ML. 315
15. *Flint side-scraper*
    Cat. No. MR. 488
16. *Flint side-scraper*
    Cat. No. MP. 243

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Plate 8 *Triangular flint points*
Scale: 1¼ natural size

	Index
1. Cat. No. MV. 106	*0.55*
2. Cat. No. MO. 264	*0.56*
3. Cat. No. MP. 1	*0.62*
4. Cat. No. MP. 248	*0.60*
5. Cat. No. MJ. 684	*0.80*
6. Cat. No. ML. 526	*0.58*
7. Cat. No. MI. 525	*0.86*
8. Cat. No. MC. 641	*0.53*
9. Cat. No. MM. 187	*0.42*
10. Cat. No. MO. 369	*0.43*
11. Cat. No. MJ. 505	*0.43*
12. Cat. No. MK. 192	*0.38*
13. Cat. No. MH. 350	*0.40*
14. Cat. No. MD. 121	*0.39*
15. Cat. No. MV. 130	*0.33*

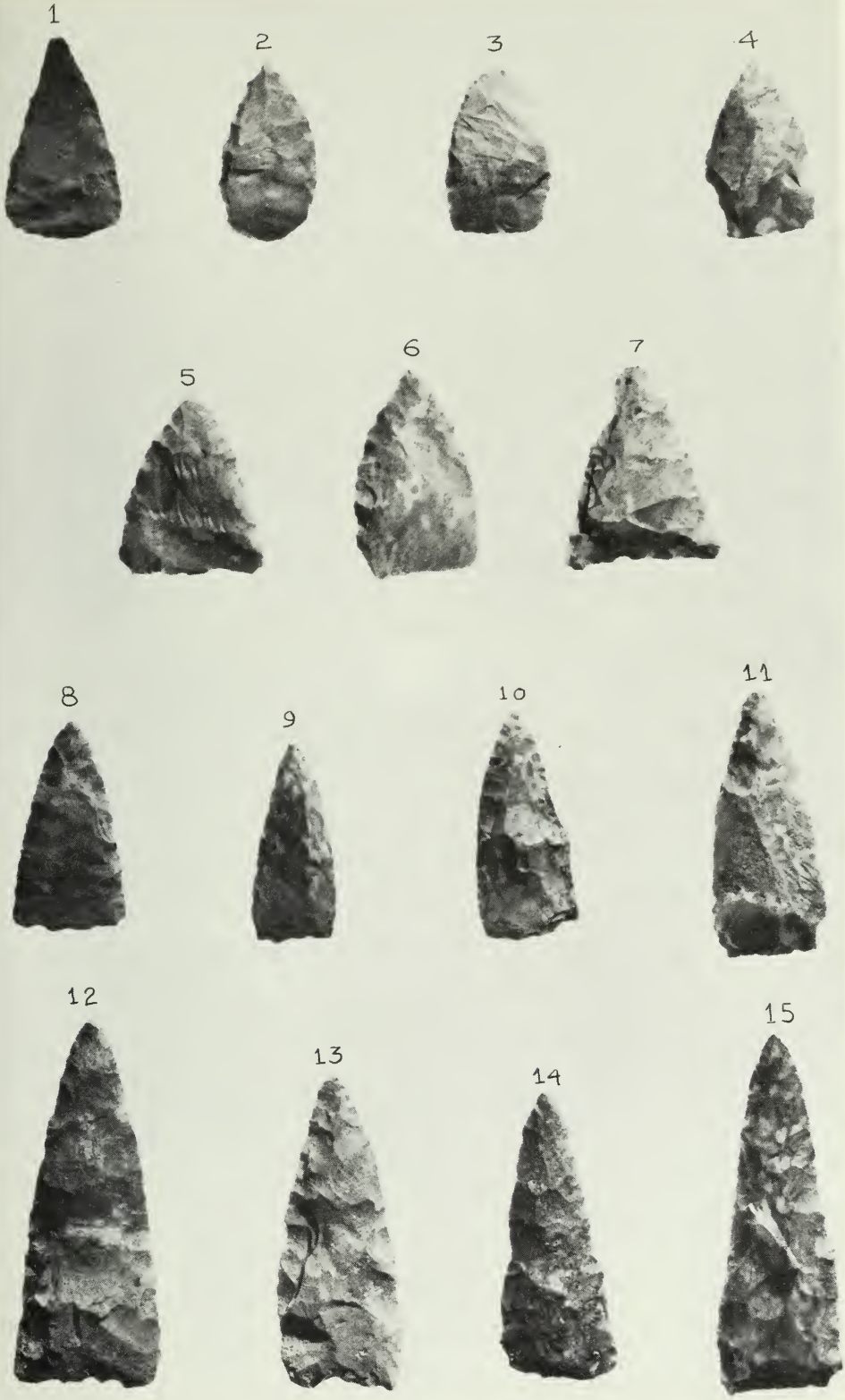
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Plate 9 *Scale: 1¼ natural size*

1. *Stemmed flint point*
   Cat. No. MB. 5
2. *Stemmed flint point*
   Cat. No. MJ. 507
3. *Stemmed flint point*
   Cat. No. MM. 290
4. *Stemmed flint point*
   Cat. No. MC. 21
5. *Side notched flint point*
   Cat. No. MH. 349
6. *Side notched flint point*
   Cat. No. MJ. 546
7. *Stemmed flint point*
   Cat. No. MJ. 504
8. *Side notched flint point*
   Cat. No. MN. 230
9. *Side notched flint point*
   Cat. No. MC. 9
10. *Stemmed (?) flint point*
    Cat. No. MK. 487
11. *Side notched moss agate point*
    Cat. No. MC. 222
12. *Flint point*
    Cat. No. MJ. 410
13. *Flint point*
    Cat. No. MC. 1
14. *Flint point*
    Cat. No. MP. 247
15. *Stemmed flint point*
    Cat. No. MD. 7
16. *Stemmed flint point*
    Cat. No. MJ. 506
17. *Stemmed flint point*
    Cat. No. MT. 155

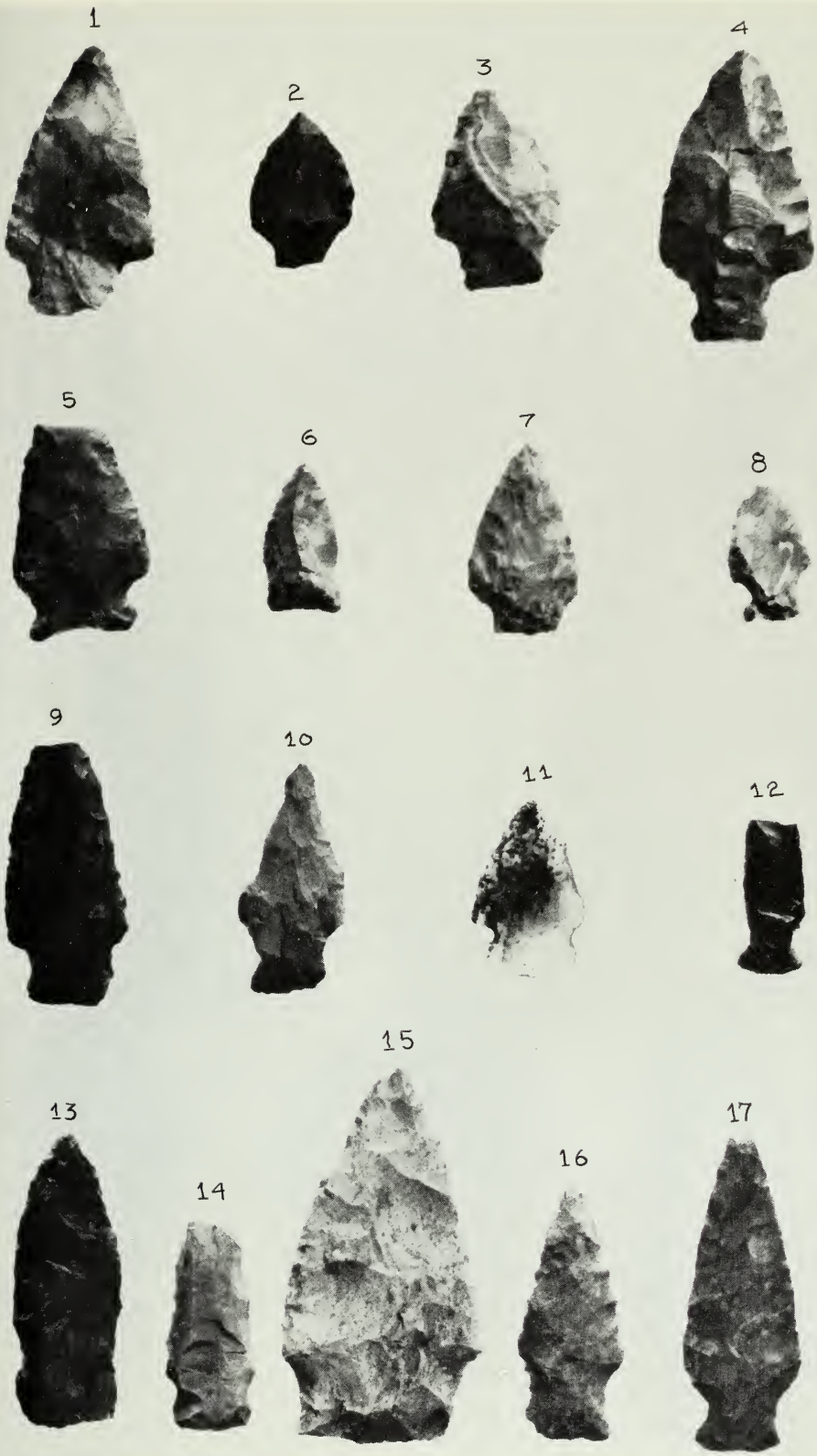
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Plate 10 *Scale: 1¼ natural size*

1. *Copper awl*
   Cat. No. MQ. 644
2. *Copper awl*
   Cat. No. MO. 26
3. *Flint point*
   Cat. No. MK. 558
4. *Flint point*
   Cat. No. MT. 93
5. *Worked pectoral spine of a channel catfish*
   Cat. No. MB1. 4
6. *Worked pectoral spine of a channel catfish*
   Cat. No. MB1.5
7. *Worked pectoral spine of a channel catfish*
   Cat. No. MB1.6
8. *Worked pectoral spine of a channel catfish*
   Cat. No. MB1.7
9. *Flint point*
   Cat. No. MH. 571
10. *Flint blade*
    Cat. No. MT. 53
11. *Flint point*
    Cat. No. MN. 164

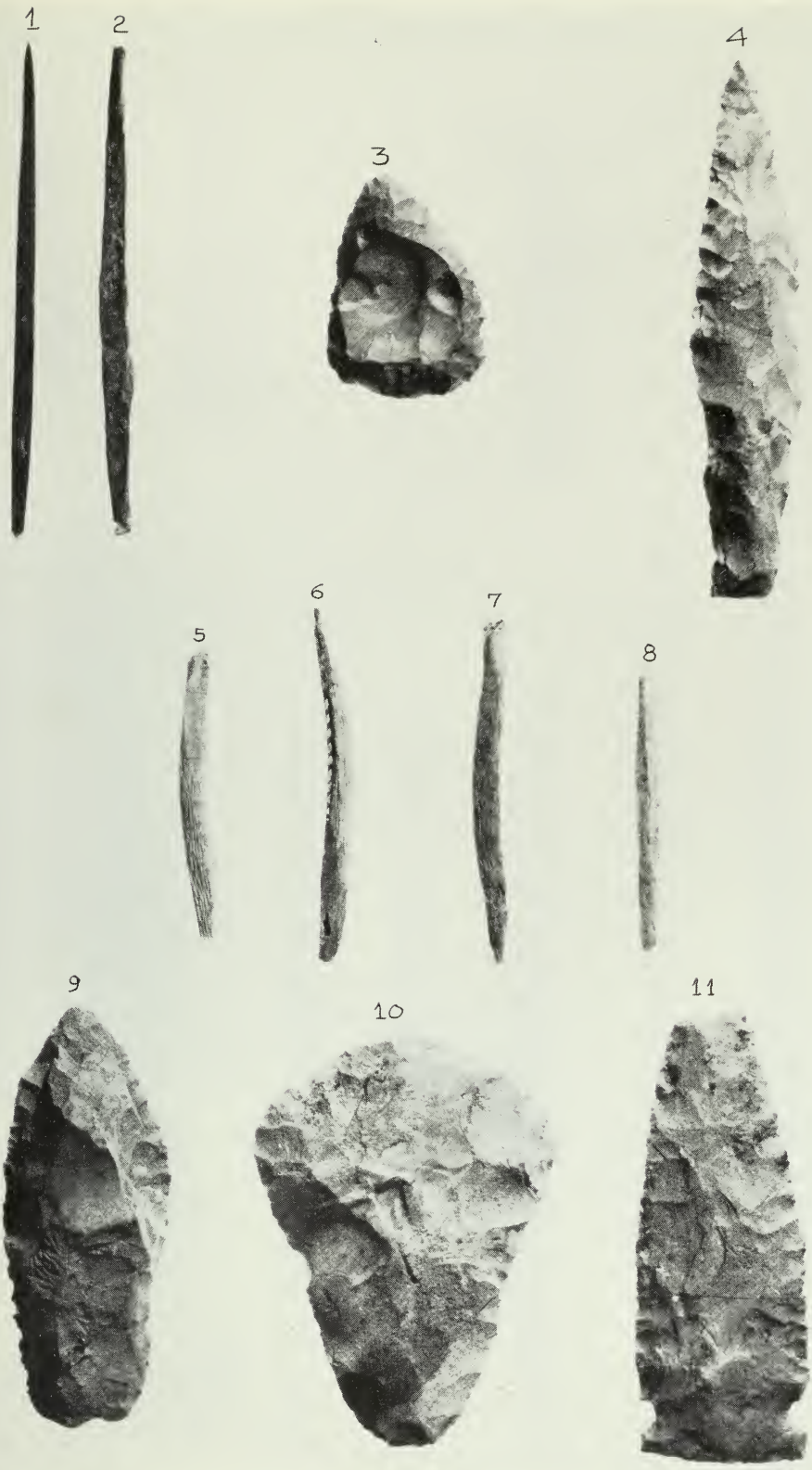
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Plate 11 *Scale: 1¼ natural size*

1. *Bone awl*
   Cat. No. MM. 114
2. *Bone awl*
   Cat. No. MO. 421
3. *Bone awl*
   Cat. No. MP. 25
4. *Bone awl*
   Cat. No. MQ. 1091
5. *Bone awl fashioned from the distal end of the left tibiotarsus of a common loon*
   Cat. No. MH. 357
6. *Bone awl fashioned from the proximal end of the right radius of a bear*
   Cat. No. MK. 535
7. *Bone needle*
   Cat. No. MK. 708
8. *Bone awl*
   Cat. No. MK. 186
9. *Bone awl*
   Cat. No. MK. 727
10. *Bone awl*
    Cat. No. MV. 174
11. *Bone awl*
    Cat. No. MK. 825

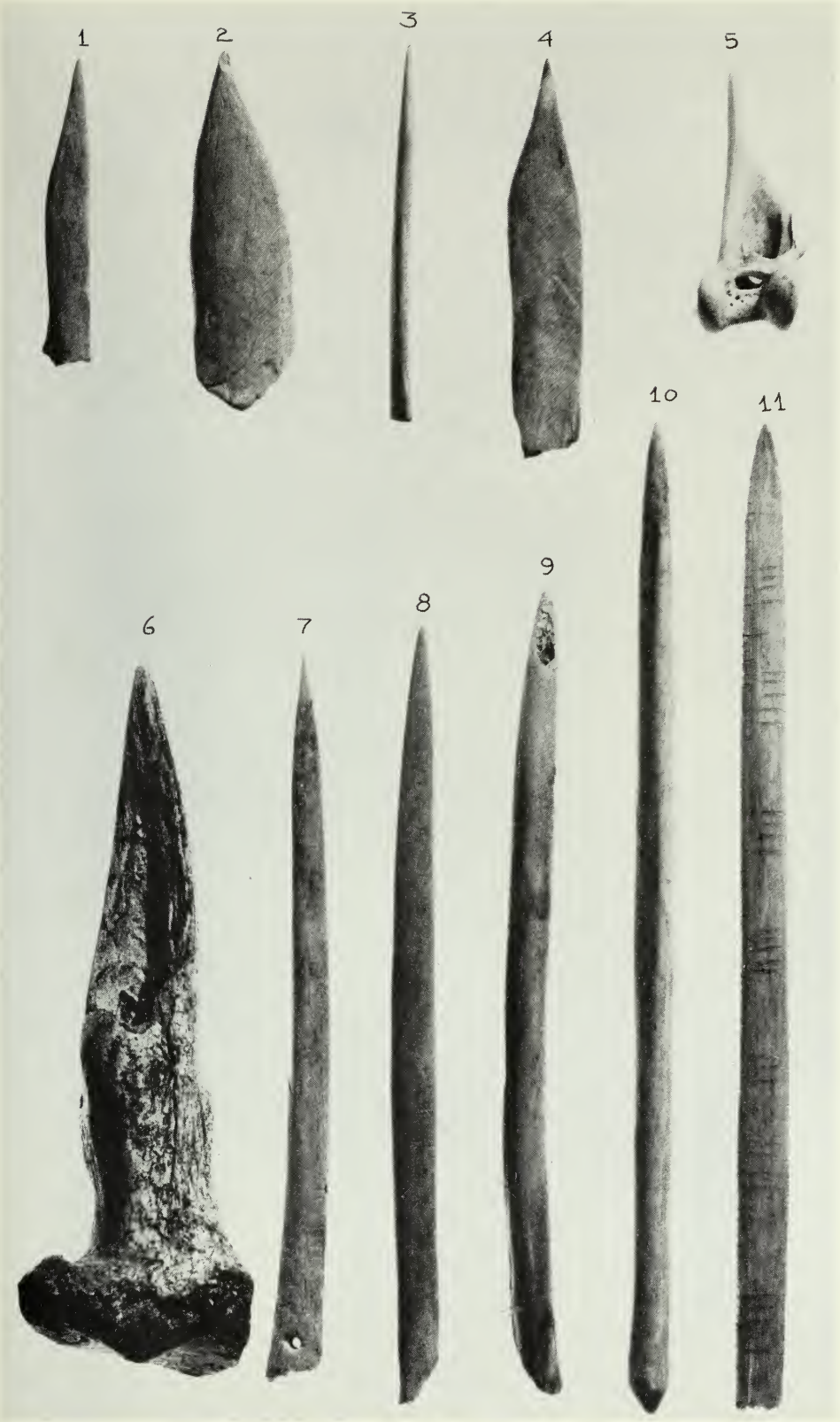
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Plate 12 *Scale: 1¼ natural size*

1. *Antler pottery marker*
   Cat. No. ML. 256
2. *Bone pottery marker*
   Cat. No. MK. 597
3. *Bone harpoon*
   Cat. No. M. B1. 3
4. *Bone point fragment (?)*
   Cat. No. MC. 640
5. *Bone point fragment*
   Cat. No. MK. 357
6. *Bone point*
   Cat. No. MH3.26
7. *Bone harpoon fragment (?)*
   Cat. No. MW. 93
8. *Bone harpoon fragment*
   Cat. No. MP. 451
9. *Unfinished conical antler point*
   Cat. No. MT. 98

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Plate 13 *Scale: 1 3/16 natural size*

1. *String of columella and copper beads*
   Cat. No. MQ. 1094
2. *Unfinished ceramic bead fashioned from broken pipe-stem*
   Cat. No. MR. 469
3. *Bird-bone bead*
   Cat. No. MP. 254
4. *Ceramic bead fashioned from broken pipe-stem*
   Cat. No. MR. 471
5. *Copper bead*
   Cat. No. MJ. 263
6. *Copper bead*
   Cat. No. MQ. 229
7. *Shell pendant fashioned from a salt water gastropod*
   Cat. No. MD. 73
8. *Bear tooth pendant fashioned from the lower left canine*
   Cat. No. MK4.21
9. *Ceramic bead*
   Cat. No. MR. 444

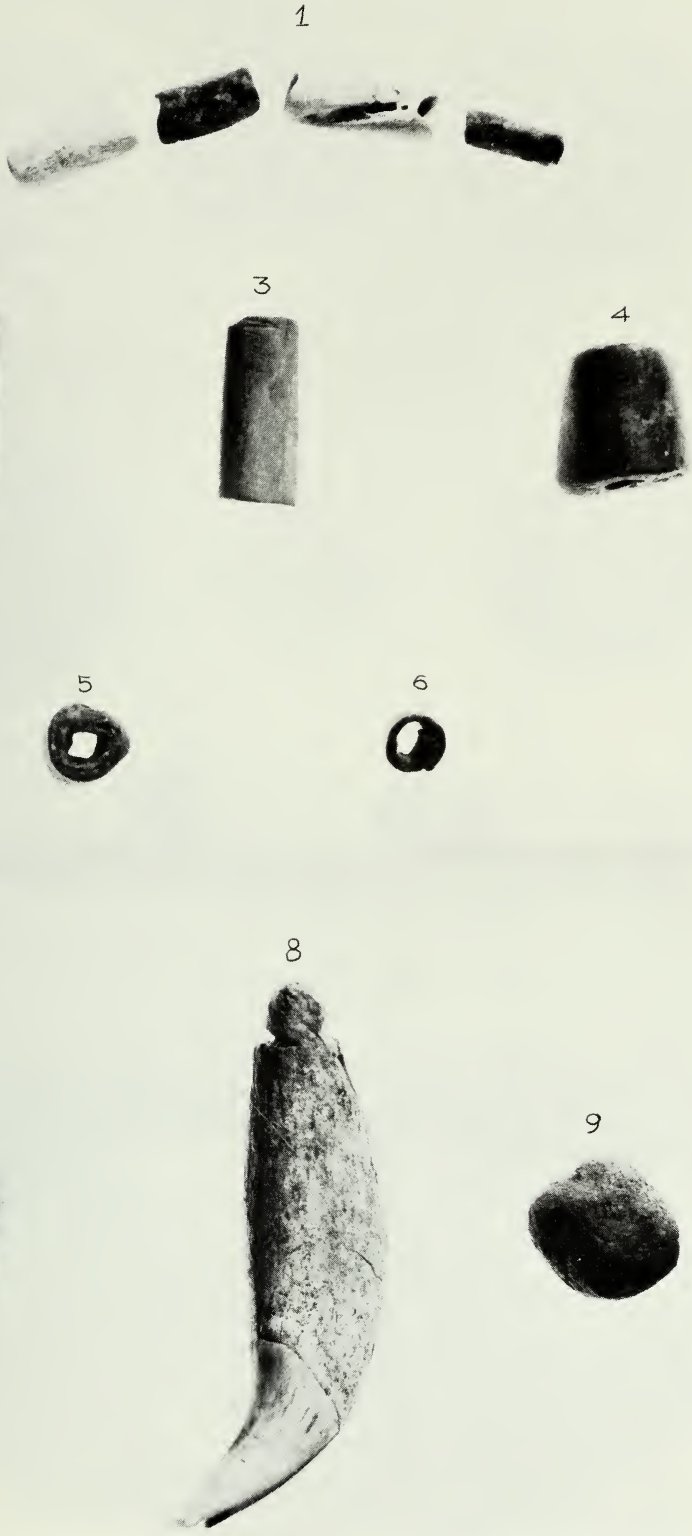
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Plate 14 *Scale: 1¼ natural size*

1. *Ceramic gaming disc*
   Cat. No. MB. 9
2. *Slate gaming disc*
   Cat. No. MG. 25
3. *Ceramic gaming disc*
   Cat. No. MV. 156
4. *Ceramic gaming disc*
   Cat. No. MP. 598
5. *Ceramic gaming disc*
   Cat. No. MH3.24
6. *Ceramic gaming disc*
   Cat. No. MK. 664
7. *Ceramic marble*
   Cat. No. MB. 10
8. *Ceramic marble*
   Cat. No. MO. 89
9. *Drilled plastron of a Blanding's turtle, probably a part of a rattle*
   Cat. No. MK. 826

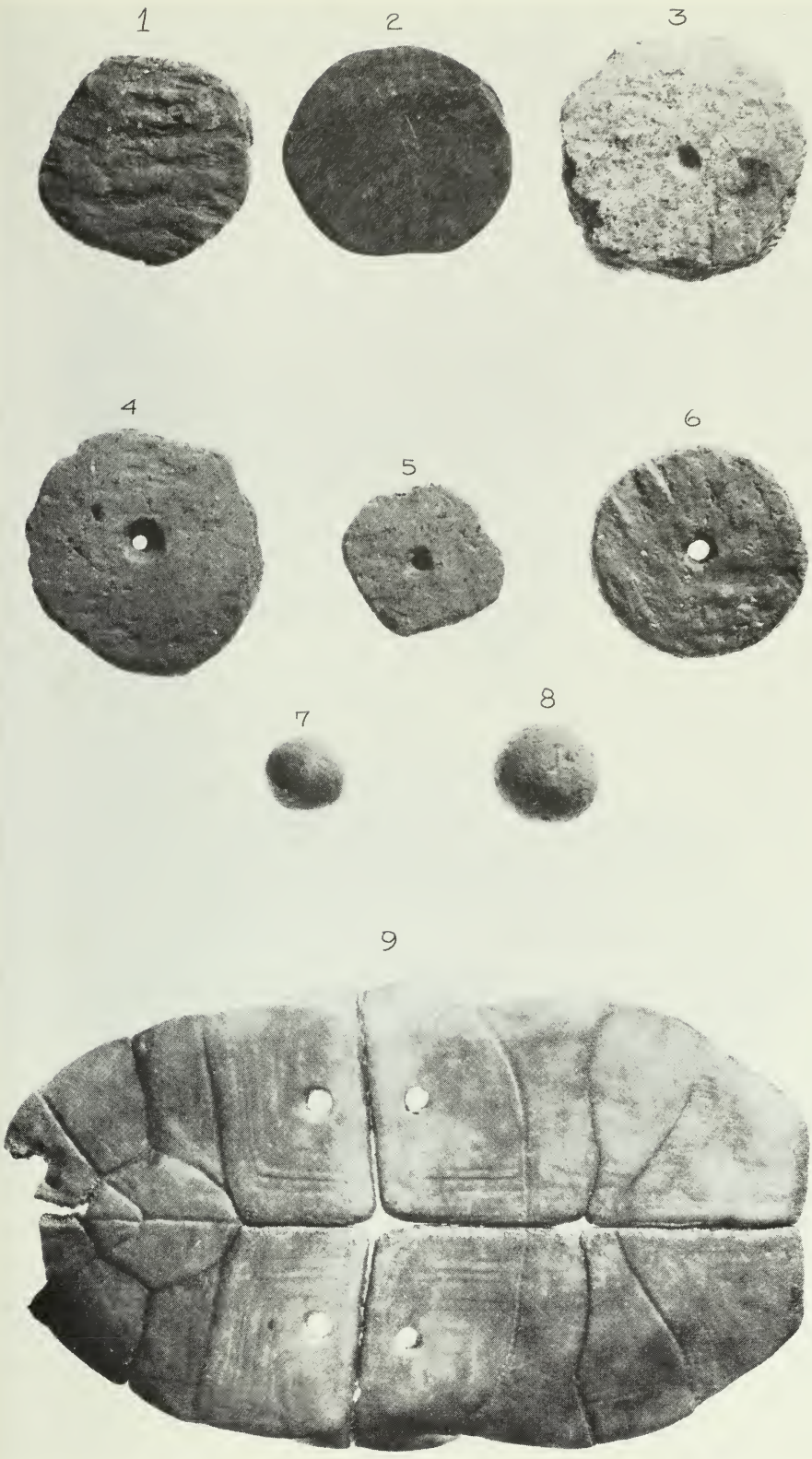
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Plate 15 *Scale: 1¼ natural size*

1. *Bodysherd, softened and brushed to expose tempering material*
   Cat. No. MK. 827
2. *Bodysherd, softened and brushed to expose tempering material*

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Plate 16 *Scale: 1¼ natural size*

1. *Rimsherd with Linear Dentate Stamp design*
   Cat. No. ME. 28
2. *Rimsherd with Linear Dentate Stamp design and double row of bosses*
   Cat. No. ME. 596
3. *Rimsherd with Linear Dentate Stamp design*
   Cat. No. MQ. 395

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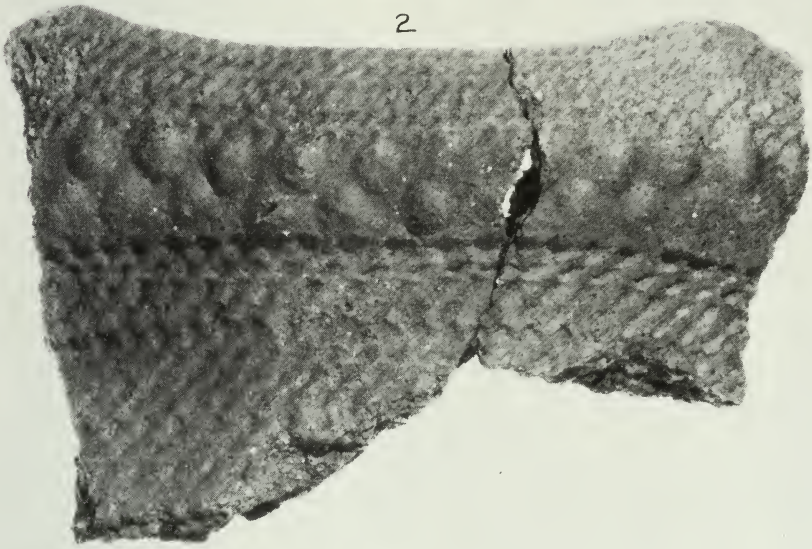

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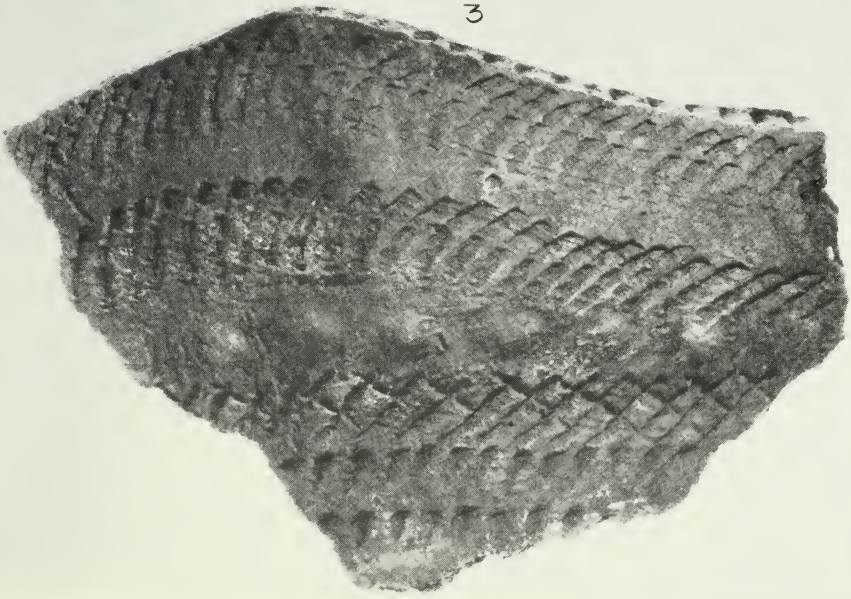

Plate 17 *Interrupted Linear Design on a vessel with a corded exterior*
Scale: 1⅜ natural size

Plate 18 *Scale: 1 3/16 natural size*

1. *Interrupted Linear design*
   Cat. No. MG. 129
2. *Interrupted Linear design*
   Cat. No. MK. 111
3. *Interrupted Linear design*
   Cat. No. MT. 346
4. *Interrupted Linear design*
   Cat. No. MK. 752
5. *Interrupted Linear design with Linear Dentate Stamping as a secondary decorative device*
   Cat. No. MD. 95
6. *Interrupted Linear design with Linear Dentate Stamping as a secondary decorative device*
   Cat. No. MN. 39
7. *Interrupted Linear design with Linear Dentate Stamping as a secondary decorative device*
   Cat. No. MB. 324

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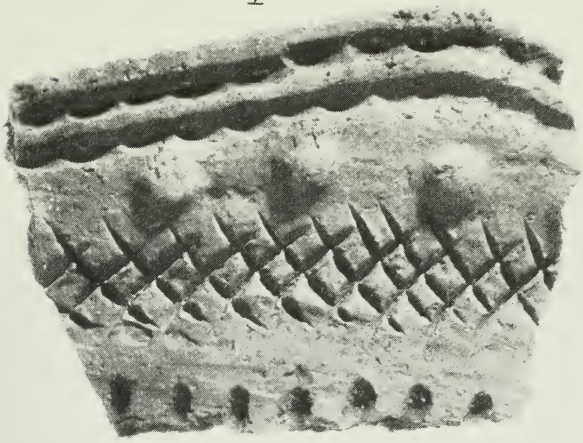
Plate 19 *Scale: 1 3/16 natural size*

1. *Interrupted Linear design with incising and punctations as a secondary decorative device*
   Cat. No. MK. 399
2. *Interrupted Linear design*
   Cat. No. MG. 523
3. *Interrupted Linear design*
   Cat. No. MP. 110
4. *Interrupted Linear design with Linear Dentate Stamping as a secondary decorative device*
   Cat. No. MT. 100
5. *Interrupted Linear design with punctations as a secondary decorative device*
   Cat. No. MQ. 645

1



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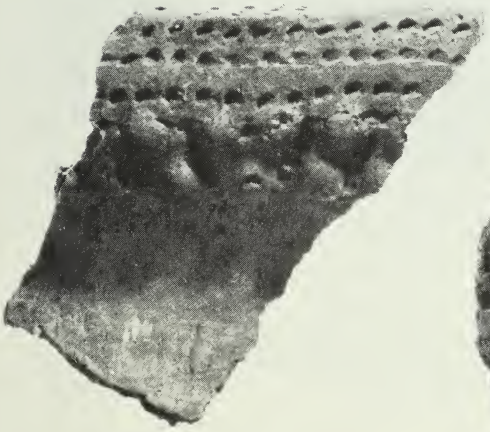

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Plate 20 *Partly restored vessel with vertically corded body and turtle-suture stamped decoration*
Cat. No. MN. 256
Scale: natural size

Plate 21 *Scale: 1 3/16 natural size*

1. *Turtle suture stamped design with incising as a secondary decorative device*
   Cat. No. MH. 316
2. *Turtle suture stamped design*
   Cat. No. MQ. 676
3. *Turtle suture stamped design. The bottom band of decoration sloping downward to the right was executed with a Linear stamp. Below this, sloping downward to the left, is a group of four lines of Interrupted Linear*
   Cat. No. MQ. 105

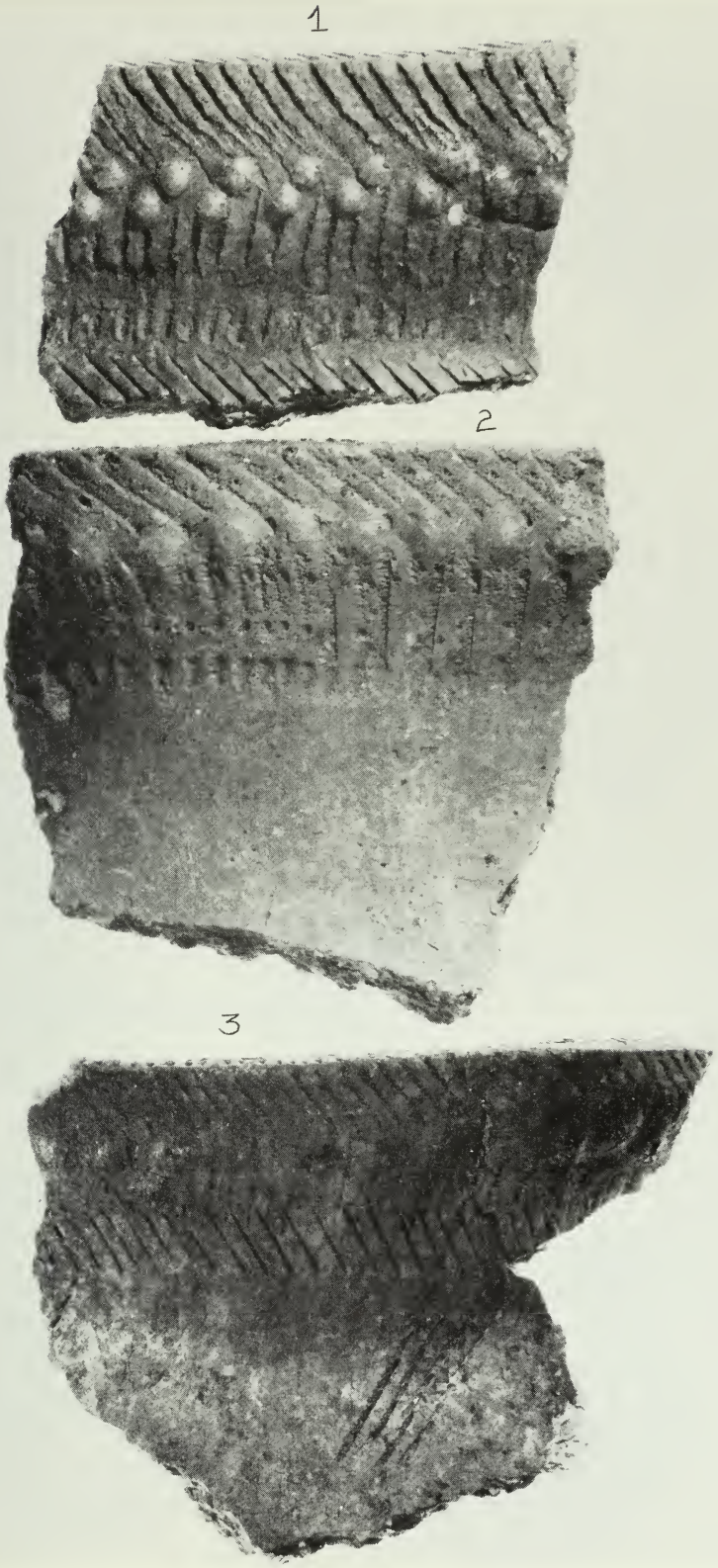
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Plate 22 *Scale: 1 3/16 natural size*

1. *Linear Dentate Stamping; probably part of a castellation*
   Cat. No. MB. 342
2. *Small castellated rimsherd decorated with punctations and a curvilinear incised line*
   Cat. No. MM. 326
3. *Castellated rim with Linear Dentate Stamp design*
   Cat. No. MH. 210
4. *Linear Dentate stamping*
   Cat. No. MG. 6
5. *Castellated rim with Linear Dentate Stamp design*
   Cat. No. MD. 181
6. *Toy pot*
   Cat. No. MH. 220
7. *Toy pot*
   Cat. No. MI. 252
8. *Toy pot*
   Cat. No. MN. 135

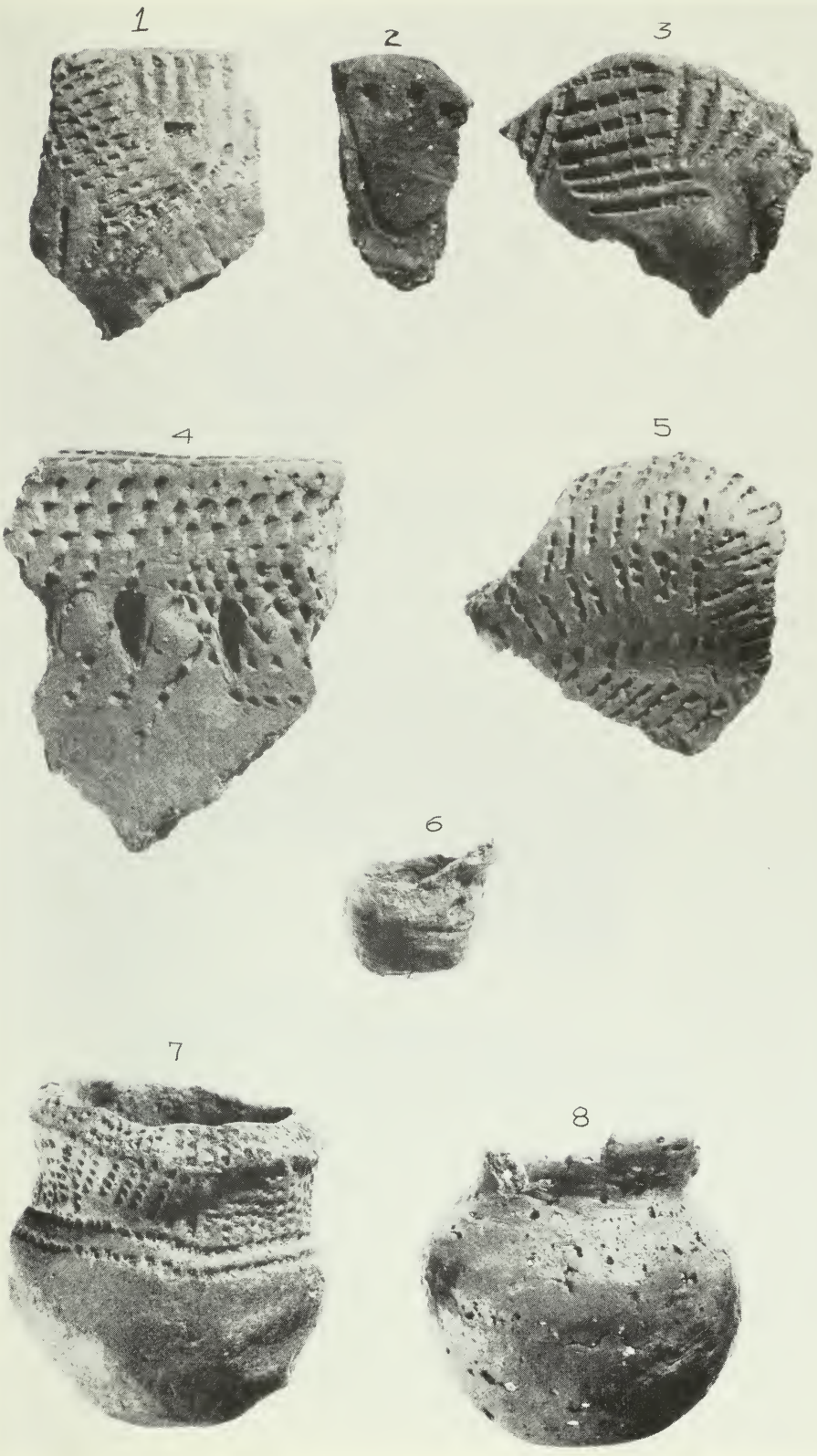
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Plate 23 *Scale: 1¼ natural size*

1. *Rimsherd with Linear Dentate Stamp design Cat. No. MX. 766*
2. *Rimsherd with Linear Dentate Stamp design Cat. No. MHF.1.183*
3. *Rimsherd with Linear Dentate Stamp design Cat. No. MT. 71*

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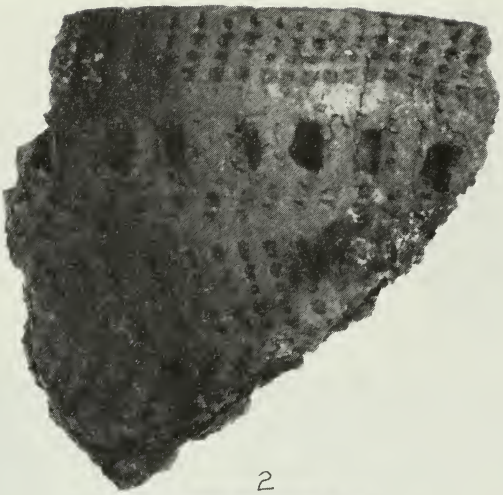

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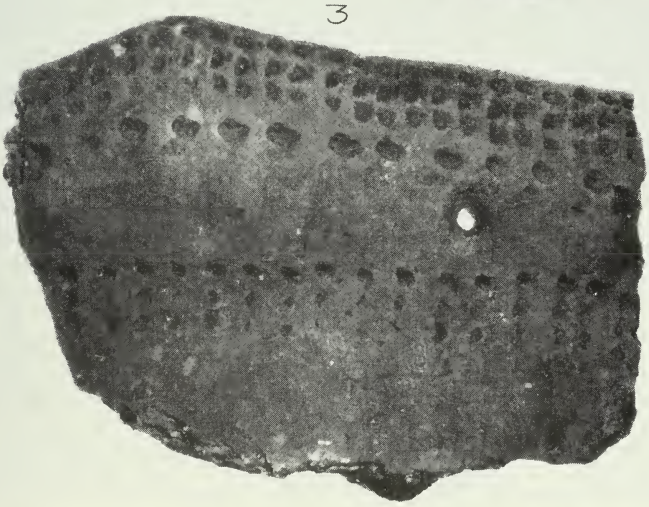

Plate 24 *Scale: 1 3/16 natural size*

1. *Rimsherd with Linear Dentate Stamp design Cat. No. MK. 431*
2. *Rimsherd with Linear Dentate Stamp design Cat. No. MH. 228*
3. *Rimsherd with Linear Dentate Stamp design Cat. No. MY. 90*

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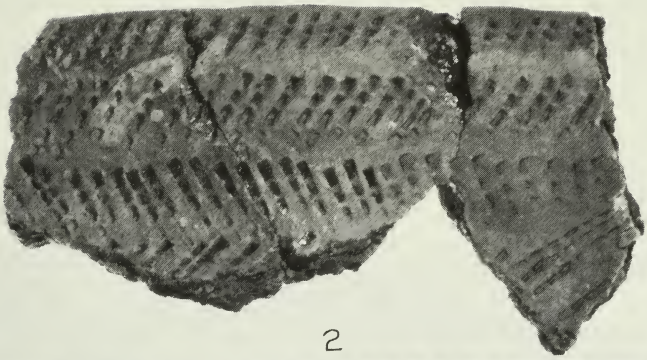

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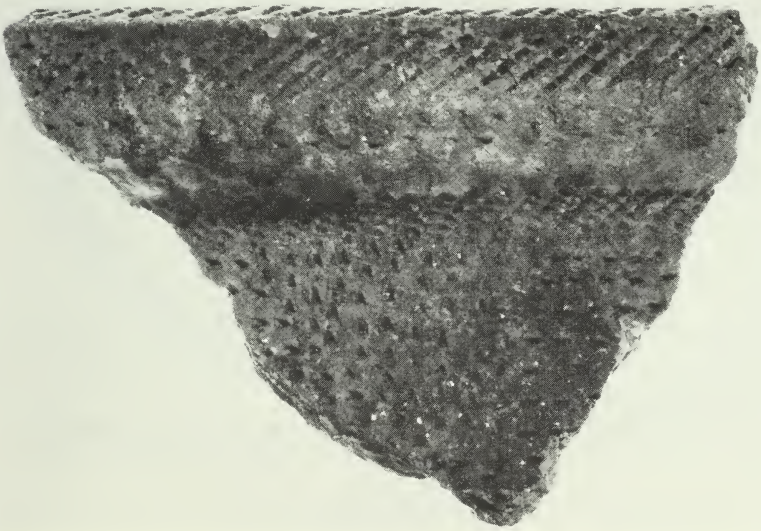

Plate 25 *Restored vessel with Linear Dentate Stamp decoration and Checked Stamp surface treatment*
Cat. No. MI. 253
Scale: ¾ natural size

Plate 26 *Partly restored vessel with Linear Dentate Stamp decoration, incised triangles as secondary decoration and Checked Stamp surface treatment*
Cat. No. MV. 177
Scale: 1½ natural size

Plate 27 *Linear Stamping with incised secondary decoration*
Scale: 1⅜ natural size

Plate 28 *Partly restored vessel with Linear Dentate Stamp decoration and Checked Stamp surface treatment*
Cat. No. MK. 827
Scale: natural size

Plate 29 *Toy pots*
Scale: 1 3/16 natural size

1. *Rimsherd*
   Cat. No. MK. 71
2. *Rimsherd*
   Cat. No. MT. 294
3. *Rimsherd*
   Cat. No. MK. 79
4. *Rimsherd*
   Cat. No. MHF.1.143
5. *Rimsherd*
   Cat. No. MC. 23
6. *Rimsherd*
   Cat. No. MC. 17
7. *Rimsherd*
   Cat. No. MR. 520
8. *Rimsherd*
   Cat. No. MV. 62

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Plate 30 *Ceramic pipes*
Scale: 1⅛ natural size

1. *Cat. No. MN. 130*
2. *Cat. No. MP. 138*
3. *Cat. No. MH. 81*
4. *Cat. No. MK. 562*
5. *Cat. No. MJ. 627*
6. *Cat. No. MQ. 628*

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Plate 31 *Stems from ceramic pipes*
Scale: 1⅛ natural size

1. *Cat. No. MB. 16*
2. *Cat. No. MR. 292*
3. *Cat. No. MQ. 7*
4. *Cat. No. MB. 111*
5. *Cat. No. MO. 333*
6. *Cat. No. MD. 155*
7. *Cat. No. MR. 93*
8. *Cat. No. MC. 61*

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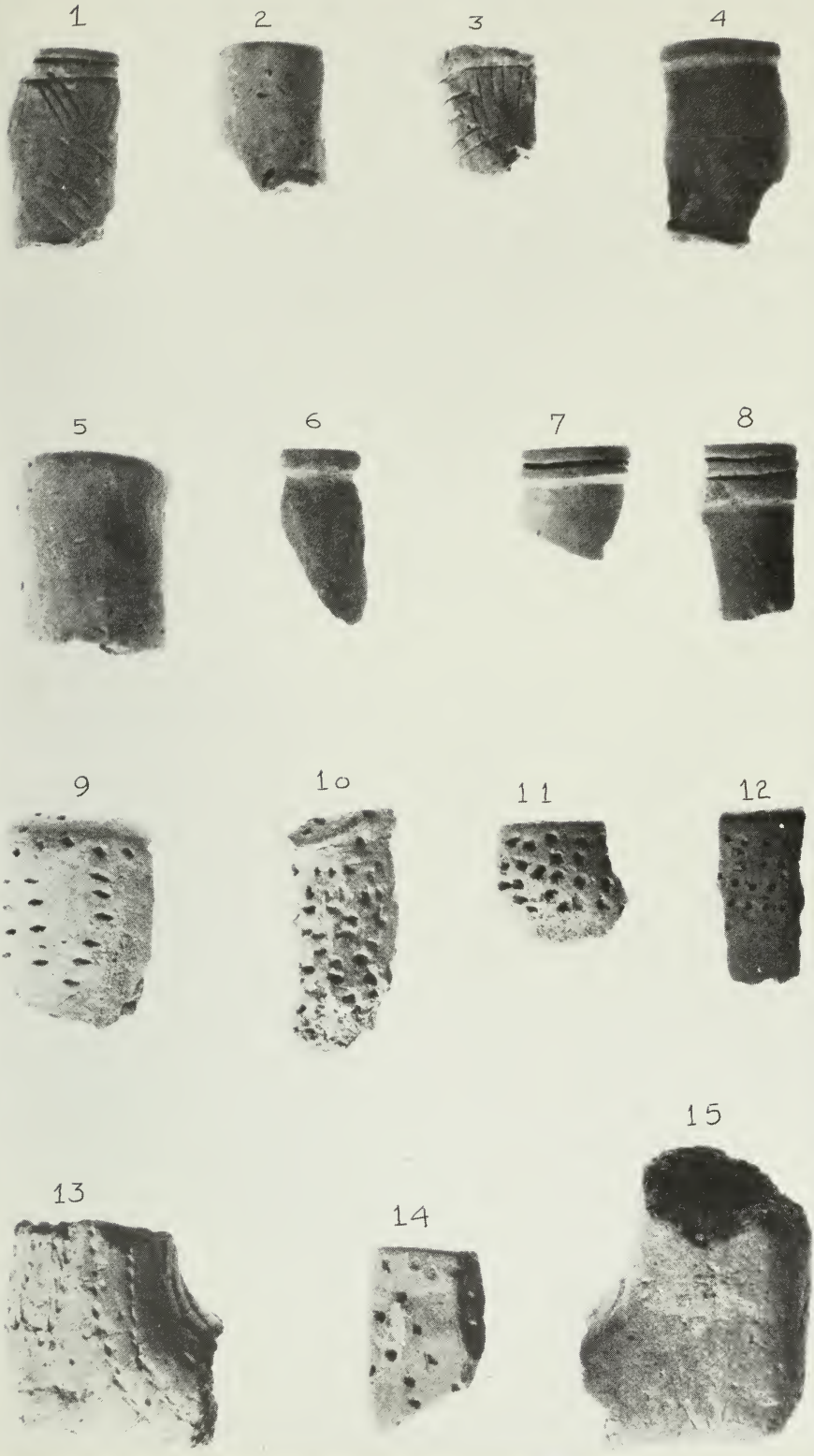
Plate 32 *Ceramic pipe-bowl fragments*
Scale: 1⅛ natural size

1. *Cat. No. MQ. 630*
2. *Cat. No. MH. 211*
3. *Cat. No. MQ. 21*
4. *Cat. No. MJ. 276*
5. *Cat. No. MB. 182*
6. *Cat. No. MQ. 212*
7. *Cat. No. MD. 50*
8. *Cat. No. MI. 720*
9. *Cat. No. MO. 21*
10. *Cat. No. MQ. 466*
11. *Cat. No. MT. 4*
12. *Cat. No. MQ. 468*
13. *Cat. No. MH. 31*
14. *Cat. No. MP. 5*
15. *Cat. No. MK. 155*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